C21.5: 950/4

Vol. 950 Number 4

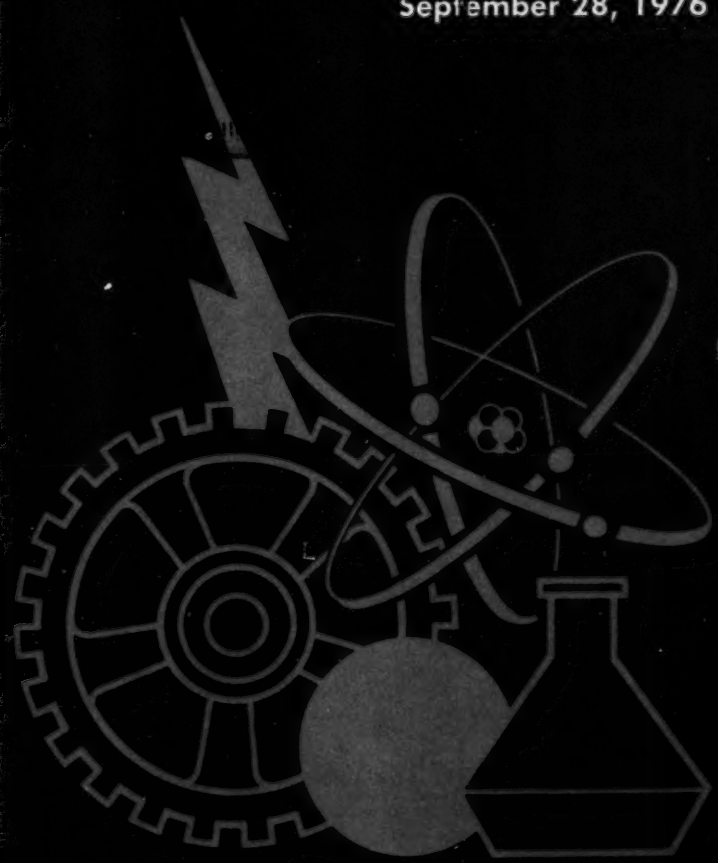
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

September 28, 1976



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September 28, 1976 Volume 950 Number 4

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PATENT NOTICES

Certificates of Correction for the Week of Sept. 28, 1976

Re. 28,886	3,935,241	3,955,401	3,964,678
3,009,855	3,935,975	3,955,803	3,964,718
3,741,721	3,936,389	3,956,338	3,964,916
3,758,332	3,936,576	3,956,589	3,965,189
3,767,805	3,937,474	3,956,738	3,965,218
3,769,058	3,937,688	3,956,962	3,965,374
3,769,152	3,937,766	3,956,996	3,965,430
3,793,555	3,938,711	3,957,085	3,965,458
3,802,971	3,939,133	3,957,115	3,965,538
3,828,057	3,942,259	3,957,448	3,965,643
3,829,746	3,942,592	3,957,464	3,966,193
3,830,649	3,942,692	3,957,755	3,966,574
3,841,639	3,944,498	3,957,854	3,966,595
3,856,886	3,945,704	3,957,877	3,966,718
3,858,337	3,945,913	3,957,919	3,966,722
3,859,913	3,945,994	3,958,029	3,966,993
3,866,849	3,946,748	3,958,138	3,967,057
3,870,693	3,947,418	3,958,955	3,967,092
3,878,152	3,947,554	3,959,026	3,967,095
3,894,029	3,947,723	3,959,049	3,967,426
3,898,265	3,948,907	3,959,078	3,967,595
3,907,760	3,948,918	3,959,323	3,967,665
3,909,201	3,949,476	3,959,445	3,968,714
3,920,828	3,949,676	3,959,508	3,968,897
3,922,402	3,951,435	3,959,519	3,968,996
3,925,329	3,951,943	3,960,667	3,969,113
3,928,429	3,952,053	3,960,838	3,969,226
3,928,464	3,952,139	3,961,093	3,969,520
3,928,465	3,952,189	3,961,109	3,970,021
3,929,821	3,953,244	3,961,306	3,970,435
3,930,016	3,953,348	3,961,343	3,970,633
3,930,956	3,953,434	3,961,409	3,970,788
3,932,820	3,953,460	3,962,263	3,971,027
3,932,881	3,953,668	3,962,681	3,971,357
3,933,225	3,954,553	3,962,906	3,971,367
3,933,461	3,954,845	3,963,315	3,972,230
3,933,774	3,954,887	3,963,443	3,972,399
3,935,200	3,955,010	3,963,695	
3,935,214	3,955,284	3,964,134	

Disclaimers

3,469,686.—*Henry W. Gutsche*, St. Louis, *Darrel M. Harris*, Kirkwood, and *Robert J. Walsh*, Ballwin, Mo. RETAINING TRAYS FOR SEMICONDUCTOR WAFERS AND THE LIKE. Patent dated Sept. 30, 1969. Disclaimer filed July 1, 1976, by the assignee, *Semicon Systems, Inc.*

The term of this patent subsequent to September 23, 1983, has been disclaimed.

3,920,976.—*Bruce A. Christensen* and *George A. Raymond*, Minneapolis, Minn. INFORMATION STORAGE SECURITY SYSTEM. Patent dated Nov. 18, 1975. Disclaimer filed May 20, 1976, by the assignee, *Sperry Rand Corporation.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

Dedications

3,381,485.—*Ralph K. Crooks, James M. Hardenbrook, Richard D. Leis, James C. Swain*, and *David L. Thomas*, Columbus, Ohio. GENERAL PURPOSE UNDERWATER MANIPULATING SYSTEM. Patent dated May 7, 1968. Dedication filed July 23, 1976, by the assignee, *The Battelle Development Corporation.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,622,251.—*Charles Malcolm Allen*, Columbus, Ohio. SEALED PISTON COMPRESSOR OR PUMP. Patent dated Nov. 23, 1971. Dedication filed July 23, 1976, by the assignee, *The Battelle Development Corporation.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,895,761.—*David G. Mills*, Beloit, Wis. REMOVABLE MUFFLER UNIT FOR GRANULATOR APPARATUS OR THE LIKE. Patent dated July 22, 1975. Dedication filed Aug. 9, 1976, by the assignee, *Beloit Corporation.*

Hereby dedicates to the Public the entire remaining term of said patent.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF AUGUST 28, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-2-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-2-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	10-3-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	11-17-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-8-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	5-21-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	11-10-75
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	11-4-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	2-27-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-8-75
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	6-2-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	11-10-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	2-20-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	12-22-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	9-11-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	1-26-76

Expiration of patents: The patents within the range of numbers indicated below expire during September 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 82nd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,901,749 to 2,907,036, inclusive
Plant Patents..... Numbers 1,851 to 1,869, inclusive

REISSUES

SEPTEMBER 28, 1976

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

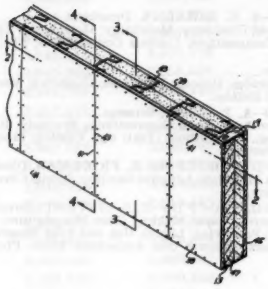
Re. 28,976
METHOD OF MAKING WALLS

Daniel L. Zinn, 2545 Beaufait, Detroit, Mich. 48207

Original No. 3,841,051, dated Oct. 15, 1974, Ser. No. 382,605, July 25, 1973. Continuation of Ser. No. 257,943, May 30, 1972, abandoned, which is a division of Ser. No. 74,022, Sept. 21, 1970, abandoned. Application for reissue Nov. 20, 1975, Ser. No. 633,747

Int. Cl.² E04B *1/74*; E04C *3/07*

U.S. Cl. 52—747 10 Claims



1. A method of constructing a sound attenuating wall between parallel fixed structures of a building comprising the steps of:

a. placing a series of double-flange elongated studs in lateral displacement between said structures, with each stud being so mounted and formed as to have a first flange of greater resiliency and a second flange of lesser resiliency, while arranging and mounting the studs in reversed alternation so that the more resilient flanges of spaced adjacent studs face in opposite directions and equally, the less resilient flanges of spaced adjacent studs also face in opposite directions; and the first flanges of one side of the wall are laterally and alternately displaced, and equally, the second flanges of one side of the wall are laterally and alternately displaced;

b. placing wall panels on one side of said series of studs so that the outer edges of adjacent panels are adjacent each other and the less resilient flanges and the central portions of panels on such side are adjacent the more resilient flanges;

c. and finally, affixing the outer edges of the wall panels on such side to the less resilient flanges on such side, with the central intermediate portions of the panels having resilient bearings at the more resilient flanges of such side [.] ;

d. with each such more resilient flange being substantially smooth and substantially free of external protuberances; so that substantially the entire area of each such more resilient flange provides a resilient overall bearing area for the adjacent central portion of a panel.

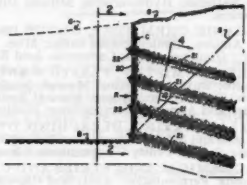
Re. 28,977
METHOD FOR THE CONSTRUCTION OF A RETAINING WALL

Edward E. Mason, Vancouver, Canada, assignor to Shotcrete Engineering, Ltd., Vancouver, Canada

Original No. 3,638,435, dated Feb. 1, 1972, Ser. No. 24,510, Apr. 1, 1970. Application for reissue Jan. 25, 1974, Ser. No. 436,446

Int. Cl.² E02D *5/18, 5/36*

U.S. Cl. 61—39 10 Claims



1. In a method of forming a retaining wall for an excavation cut for restraining an embankment of earth, including the steps of:

a. forming a skin against the excavation cut with pneumatically applied concrete;

b. forming reinforced dowels in a general arrangement of rows, one above the other, and extending from the skin into the earth embankment by drilling boreholes therein, inserting reinforcing rods into the boreholes with end portions of the rods projecting from the boreholes and filling the boreholes with grout;

c. forming wale beams along the dowel rows with pneumatically applied concrete directed against the skin, against the ends of the dowels and about the reinforcing rod projections; and

d. applying a locking means at the ends of the reinforcing rod projections to secure the [wall] *wale* beams to the dowels and thereby integrate the components into a unitary structure.

Re. 28,978
FAIL-SAFE SUBSEA FLUID TRANSPORTATION SYSTEM

Warren B. Brooks, Darien, Conn., assignor to Mobil Oil Corporation, New York, N.Y.

Original No. 3,454,083, dated July 8, 1969, Ser. No. 649,935, June 29, 1967. Application for reissue Feb. 24, 1971, Ser. No. 118,251

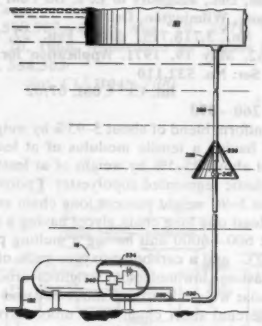
Int. Cl.² E21B *43/01, 15/02*

U.S. Cl. 166—.5 9 Claims

7. A method of recovering a fluid such as oil or the like escaping from a crack in a flowline or the like submerged in a body of water, the method comprising:

locating a fluid containing container over and adjacent said

crack;
passing at least some of the fluid trapped within said container

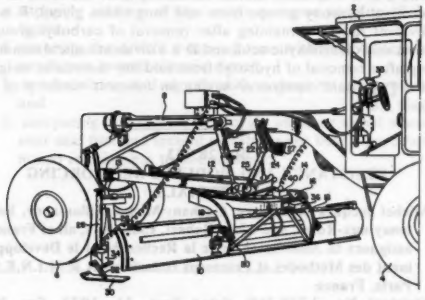


upwardly through a conduit to the surface of the water; and disposing of the fluid at the surface of the water.

Re. 28,979
CONTROL SYSTEM FOR ROAD GRADER

George E. Long, Monroe; Floyd C. Johnson, Seattle, and Dennis L. Reese, Kirkland, all of Wash., assignors to Grad-Line, Inc., Woodinville, Wash.

Original No. 3,971,452, dated Feb. 12, 1974, Ser. No. 125,293, Mar. 17, 1971. Application for reissue Mar. 19, 1975, Ser. No. 559,910
Int. Cl.[2] E02F *3/85*
U.S. Cl. 172—4.5 **14 Claims**



1. In a traveling machine having a movable frame, an elongated surface working element supported by said frame, and adjustment means on the machine to independently adjust the elevation of each end of the element and its rotational position relative to said frame, said machine being adapted to establish a planar surface having a predetermined cross [shape] *slope* angle defined as the angle between the surface established and a horizontal plane, said angle being located in a vertical plane perpendicular to the direction of travel of the machine, a control system comprising in combination;

grade sensing and control means operatively associated with said working element and said adjustment means for sensing a present grade datum and maintaining one end of said working element at a predetermined elevation related to said grade datum during travel of the machine,

a slope sensing unit operatively associated with said working element and having means to produce a slope signal proportional to the degree of inclination of said element relative to a horizontal plane,

input slope signal means providing a constant signal of predetermined value corresponding to the desired slope angle of the working element,

slope signal mixing means adapted to produce a difference signal representing the difference between said input slope signal and said sensed slope signal,

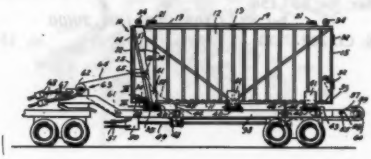
slope control means responsive to said difference signal for controlling said adjustment means for correcting the elevation of the other end of said working element to maintain said desired slope angle, and

position sensing means operatively associated with said working element and responsive to the rotary position of said working element relative to the machine frame for modifying the given slope setting of said input slope signal means in relation to the rotary position of said working element, whereby said element establishes a planar surface having said predetermined cross slope regardless of the rotary position thereof during travel of said machine.

Re. 28,980
DISCRETE MATERIAL TRANSPORTING AND DUMPING APPARATUS AND METHOD

Harold B. Mackenzie, 330 Naperville Road, Wheaton, Ill. 60187

Original No. 3,720,328, dated Mar. 13, 1973, Ser. No. 114,005, Feb. 9, 1971. Application for reissue Jan. 22, 1975, Ser. No. 543,188
Int. Cl.[2] B65G *67/02*
U.S. Cl. 214—38 D **22 Claims**



1. The combination of a discrete material transporting and dumping apparatus and a supporting structure therefor, comprising:

a large capacity container having a bottom wall with opposite coextensive spaced side walls rising therefrom, a top wall, a front end and a rear end, and defining therein a discrete material receiving chamber;

means on said bottom wall for removably supporting the container on said supporting structure;

a forwardly and rearwardly reciprocable pusher structure in said chamber having a front side facing toward said front end and a rear side directed toward said rear end, with edges close to said bottom, side and top walls;

driving means mounted on said supporting structure; means for releasably connecting the pusher structure to said driving means for actuating the pusher structure reciprocably between said front and rear ends;

closure door means at said rear end;

said pusher structure being operable by said driving means when the door means are open to discharge the material contents from said chamber through the open rear end; and

means on said supporting structure to hold the container against displacement by reason of driving force of said driving means acting on said pusher.

18. A method of transporting and dumping solid discrete material, comprising:

at a loading site filling a large capacity material-receiving chamber within a container with discrete material, said

container having a mobile pusher at one end of the chamber and an opposite unloading end of the chamber provided with an opening defined by the unloading ends of the chamber walls, and selectively operable closure door means closing the opening;

transferring the container to a dumping site;

positioning the container so that the pusher end is adjacent to and in alignment with a pusher driving means mounted separately and independently of the container on a supporting structure;

releasably connecting said separate and independent pusher driving means to said mobile pusher;

opening said closure door means for discharge of the material through said unloading end opening;

activating the driving means to apply thrust force to said pusher and thereby moving the pusher in said chamber toward said unloading end opening and ejecting the discrete material load contents from the chamber;

holding the container against displacement relative to said supporting structure and said driving means as the thrust force is applied to the load contents by the pusher;

after ejection of said load contents releasing said driving means from the pusher; and

transferring the container away from said driving means.

Re. 28,981

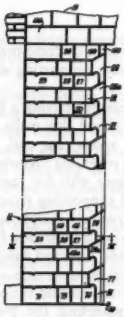
REFRACTORY SHAPES AND JAMB STRUCTURE OF COKE OVEN BATTERY HEATING WALL

Jack Hyde, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Original No. 3,878,053, dated Apr. 15, 1975, Ser. No. 394,301, Sept. 4, 1973. Application for reissue Dec. 3, 1975, Ser. No. 637,156

Int. Cl.² C10B *1/00, 1/06, 29/00*

U.S. Cl. 202—223 **15 Claims**



1. In a coke oven battery having heating walls with vertical flues therein, a jamb structure at the ends of each heating wall comprised of horizontal courses of refractory brick shapes comprising:

a. a plurality of vertically arranged adjacent interdigitating refractory jamb shapes with each shape having top and bottom parallel planar sloping surfaces coacting with adjacent jamb and intermediary end wall refractory shapes.

Re. 28,982

BLENDS OF THERMOPLASTIC COPOLYESTER ELASTOMERS WITH VINYL CHLORIDE POLYMERS

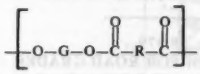
Robert W. Crawford, and William K. Witsiepe, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Original No. 3,718,715, dated Feb. 27, 1973, Ser. No. 145,062, May 19, 1971. Application for reissue Nov. 8, 1974, Ser. No. 522,110

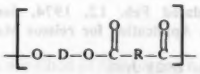
Int. Cl.² C08L *67/02*

U.S. Cl. 260—873 **19 Claims**

1. A uniform blend of about 5–95% by weight vinyl chloride polymer having a tensile modulus of at least about 50,000 p.s.i. and about 95–5% by weight of at least one *elastomeric* thermoplastic segmented copolyester [polymer] containing (1) about 5–90 weight percent long chain ester units derived from at least one long chain glycol having a molecular weight of about 600—6000 and having a melting point of less than about 60°C. and a carbon-to-oxygen ratio of at least about 2 and at least one low molecular weight dicarboxylic acid having a molecular weight less than about 300 and (2) about 10–95 weight percent short chain ester units derived from at least one low molecular weight diol having a molecular weight of less than about 250 and at least one low molecular weight dicarboxylic acid having a molecular weight of less than about 300, said long chain ester units and short chain ester units randomly joined head-to-tail through ester linkages, said long chain ester units being represented by the formula



and said short chain ester units being represented by the formula



where G is a divalent radical remaining after the removal of terminal hydroxy groups from said long chain glycol; R is a divalent radical remaining after removal of carboxyl groups from said dicarboxylic acid; and D is a divalent radical remaining after removal of hydroxyl from said low molecular weight diol [.] ; *said copolyester having an inherent viscosity of at least 0.6.*

Re. 28,983

RESISTANCE AND MODULUS REINFORCING MATERIALS

Michel Jacques Sindzingre, Cachan; Michel Villamayor, Fontenay-aux-Roses, and Alain Robert, Elancourt, all of France, assignors to Association pour la Recherche et le Developpement des Methodes et Processus Industriels A.R.M.I.N.E.S., Paris, France

Original No. 3,758,369, dated Sept. 11, 1973, Ser. No. 118,187, Feb. 23, 1971. Application for reissue Oct. 7, 1975, Ser. No. 620,496

Claims priority, application France, Feb. 23, 1970, 70.06383

Int. Cl.² B32B *5/16*

U.S. Cl. 428—114 **4 Claims**

1. A composite material having improved mechanical properties comprising, a resistant material, a reinforcing material with high modulus and a matrix material, said resistant material is flat, disposed parallel to a director plane and is selected from the group consisting essentially of steel, titanium, nickel and alloys thereof, said high modulus reinforcing material is selected from the group consisting essentially of boron, silicon carbide, titanium boride, aluminium diboride and magnesium diboride, said high modulus reinforcing material being in the form of flakes or bands and disposed parallel to the director plane.

Re. 28,984

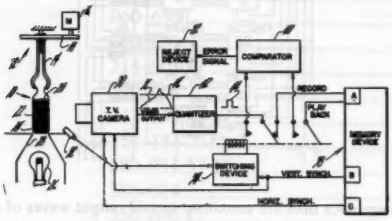
ARTICLE INSPECTION BY SUCCESSIVELY TELEVISED IMAGES

William H. Drinkuth, Hebron, and Edward J. Stephens, Manchester, both of Conn., assignors to Emhart Industries, Inc., Farmington, Conn.

Original No. 3,598,907, dated Aug. 10, 1971, Ser. No. 730,377, May 20, 1968. Application for reissue Mar. 14, 1975, Ser. No. 558,303

Int. Cl.[2] H04N 7/00

U.S. Cl. 178—6 15 Claims



10. A method for inspecting *liquid filled* articles comprising the steps of

a. placing the article at an inspection station,

b. scanning the article with a television camera to produce an electric signal which varies in accordance with the image seen by said camera,

c. storing said signal in a memory device for subsequent use,

d. rotating the article so that the orientation of the inspection portion with respect to the camera is altered,

e. stopping rotation of the article to cause swirling of the liquid,

f. scanning the article a second time with said camera to produce a second electric signal,

g. synchronizing said signals with respect to one another, and

h. comparing said signals to provide an error signal whenever said first and second signals do not bear a predetermined relationship to one another.

Re. 28,985

ALARM CLOCK TIMER WITH MANUALLY OPERABLE RESET MECHANISM

Robert L. Boyles, Wayland, and Samuel Polonsky, Medway, both of Mass., assignors to General Electric Company, Bridgeport, Conn.

Original No. 3,740,502, dated June 19, 1973, Ser. No. 241,963, Apr. 7, 1972. Application for reissue Nov. 24, 1975, Ser. No. 634,893

Int. Cl.[2] H01H 43/04

U.S. Cl. 200—38 FA 6 Claims

1. In an alarm clock mechanism the improvement comprising:

a. a timing mechanism;

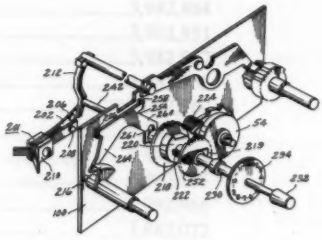
b. a supporting structure;

c. a first cam member rotatably mounted on said supporting structure;

d. a second cam member rotatably mounted on said supporting structure in coaxial relationship with said first cam member and axially movable with respect thereto, *said second cam member having a longitudinal axis and being mounted for rotation about said axis, said second cam member having a first side facing generally toward said first cam member and another side facing generally away from said first cam member, said first side including a generally flat raised surface, a generally flat lower surface longitudinally spaced from said raised surface away from said first cam member, and a generally curved surface with a radially indented portion positioned between said lower surface and said raised surface;*

e. one of said cam members being caused to rotate by said timing mechanism;

f. means for manually adjusting the relative angular position of said cam members;



g. an on-off control mechanism having a resilient member exerting a spring force urging said second cam member axially toward said first cam member;

h. said second cam member being disposed to move axially under the influence of said spring force to permit said control mechanism to be moved to its on position upon relative rotation of said cam members through a predetermined relative angular position;

i. [one of said cam members] *said first cam member* including a cam follower [which is] rotatable with said [one of said cam members] *first cam member* for cooperation with *said* [raised and lower cam] surfaces of [the other] *said second* cam member to permit said resilient member to move said second cam member toward said first cam member to permit the control mechanism to be moved to its on position; and

j. said cam follower being mounted for movement with respect to the [cam member on which it is supported] *first cam member* for permitting said cam follower to remain on the [lower cam surface of said other cam member] *curved surface of said second cam member* so that said timing mechanism is not required to move said

cam follower from a lower cam surface on said [other] *second* cam member to a higher cam surface of said [other] *second* cam member against the force of said resilient member.

Re. 28,986

STATIC INVERTER WHEREIN A PLURALITY OF SQUARE WAVES ARE SO SUMMED AS TO PRODUCE A SINUSOIDAL OUTPUT WAVE

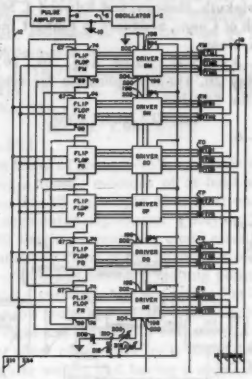
Theodore M. Heinrich, American Township, County of Allen, and Andress Kernick, Lima, both of Ohio, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Original No. 3,491,282, dated Jan. 20, 1970, Ser. No. 117,966, June 19, 1961. Application for reissue Aug. 25, 1975, Ser. No. 607,403

Int. Cl.[2] H02M *7/537*

U.S. Cl. 321—5 **28 Claims**

1. In an apparatus for inverting unidirectional potential into alternating potential of a predetermined frequency, an N number of phase displaced voltage generators, N being at least 3, each said generator having a square shaped output voltage wave of said predetermined frequency *and same amplitude*, and means *for dimensioning said square shaped output voltages in amplitude, and for* combining the outputs of said generators to produce a resulting voltage wave of stepped configuration, the magnitudes of *dimensioned* said output voltage waves being so related to the magnitudes of the phase displacement of said generators that said resulting wave generally follows the configuration of a sine wave and contains a lesser quantity



of harmonics than are contained in said output waves of said generators.

PATENTS

GRANTED SEPTEMBER 28, 1976

ERRATA

For CLASS	See PATENT NO.
051–295	3,982,359
060–650	3,982,378
060–659	3,982,379
214–001 Q	3,982,627
299–064	3,982,688
242–055.19 A	3,982,701
254–184	3,982,728
280–011.37 H	3,982,747
280–018	3,982,748
350–096 C	3,982,810
323–078	3,982,814
356–103	3,982,816
418–149	3,982,864
071–118	3,982,931
429–163	3,982,957
429–057	3,982,958
429–199	3,982,960
429–034	3,982,961
429–019	3,982,962
134–100	3,982,965
429–136	3,982,966
252–460	3,983,072
252–470	3,983,073
252–500	3,983,074
252–511	3,983,075
252–518	3,983,076
252–520	3,983,077
252–540	3,983,078
252–545	3,983,079
526–240	3,983,083
526–015	3,983,095
526–064	3,983,096
526–049	3,983,097
536–017	3,983,102
536–009	3,983,103
536–024	3,983,104
424–078	3,983,209
424–170	3,983,213
424–180	3,983,214
426–329	3,983,251
428–403	3,983,254
178–006.8	3,983,328
313–113	3,983,513
354–086	3,983,567

PATENTS

GRANTED SEPTEMBER 28, 1976

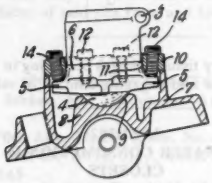
NOTE—Cross reference listings of applications published under the first and second Trial Voluntary Protest Programs are located in the back of this Issue. These entries will be in numerical order by document publication number.

GENERAL AND MECHANICAL

3,982,278
ALIGNMENT DEVICE FOR ARTIFICIAL LIMBS

Denis Ronald William May, London, England, assignor to J. E. Hanger & Company Limited, London, England

Filed Jan. 29, 1976, Ser. No. 653,605
Claims priority, application United Kingdom, Feb. 21, 1975, 7288/75
Int. Cl.² A61F *1/08, 1/04*
U.S. Cl. 3—21 **5 Claims**



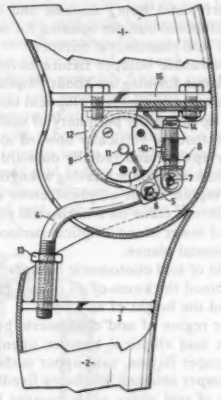
1. An alignment device for a tube socket and an artificial limb element comprising two oppositely facing concentric part-spherical convex surfaces formed on the end of the socket which are engaged by complementary concave surfaces formed within the limb element and within a clamping ring, clamping screws passing through plain holes in the ring into threaded holes in the limb element, tightening of which can induce a controlled degree of frictional resistance between the said part-spherical surfaces, and at least one pair of jacking screws passing through threaded holes in the ring on at least one diameter thereof to engage abutments on the socket, the arrangement being such that an angular alignment between the socket and the limb element set by operation of the jacking screws can be maintained by pure friction between the part spherical surfaces.

3,982,279
MECHANICAL PROSTHESIS OF THE KNEE

Mario Capella Valenti, and Jorge Capella Samaranch, both of General Mitre, 188 - 1º, Barcelona-6, Spain

Filed Mar. 6, 1975, Ser. No. 556,112
Int. Cl.² A61F *1/04, 1/08*
U.S. Cl. 3—27 **5 Claims**

1. A mechanical prosthesis of a knee with a brake system for locking the knee and comprising a thigh member; a leg member; brake means joining said thigh and leg members and having a drum member in said thigh member; an inverted U-shaped support integral with said drum member, the base of said U-shaped support being fixed to a rigid plate member on said thigh member; a band member surrounding said drum and being open at a single point; two parallel and perforated flat radial lugs on said band and located respectively above and below said opening; a tie-rod passing through said lugs, said tie-rod being bevelled on its upper portion; a nut engaging a threaded portion of said tie-rod on said upper portion of said tie-rod; pin means passing through said nut and said tie-rod to lock said nut to said tie-rod; lever means with unequal arms connected to the lower portion of said tie-rod, said lower portion of said tie-rod being U-shaped, said band having a projection on which said lever means is pivoted, the shorter arm of said lever means being connected with said tie-rod and the longer arm of said lever means being curved at its rear portion to form a substantially vertical portion, said vertical portion of said longer arm being threaded, and a nut engaging

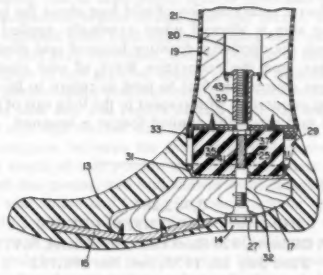


the threaded portion of said longer arm and abutting a portion on said leg member.

3,982,280
FUNCTIONAL ANKLE FOR A PROSTHETIC LIMB

Charles C. Asbelle, Oakland; Gene R. Helmuth, Castro Valley; William R. Applegate, and Gerald K. Porter, both of Oakland, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 357,049, May 3, 1973, abandoned. This application Oct. 6, 1975, Ser. No. 619,873
Int. Cl.² A61F *1/04, 1/08*
U.S. Cl. 3—32 **1 Claim**



1. An ankle device for a prosthetic limb comprising:
a. shin block;
b. a foot;
c. a cable assembly;
d. a bumper assembly;
e. said bumper assembly including an upper ankle bumper fixture, a lower ankle bumper fixture and an elastomeric bumper;
f. said upper ankle bumper fixture including a top plate and a plurality of supporting plates; said top plate having a

length, width and thickness wherein said length is greater than said width and said thickness is substantially less than said width and length; said plurality of support plates having a length, width and thickness wherein the length, width and thickness of each of said support plates is about the same as the length, width and thickness of said top plate; each of said support plates having an about elliptical opening that has a major axis coincidental with the centerline of said length; said top plate and said plurality of support plates being stacked and interconnected to form an elliptical bumper opening for receiving the upper region of said elastomeric bumper;

g. said lower ankle bumper fixture having a length, width and thickness forming an about elliptical surface having about the same size as said elliptical bumper opening and having a lip about the periphery of said elliptical surface, said lip extending vertically upward along the sides and vertically upward and radially outward along the ends;

h. said elastomeric bumper having a length, width and thickness having an about elliptical cross section when said cross section is taken on a horizontal plane and about flat upper and lower about elliptical surfaces lying in respective horizontal planes;

i. said height of said elastomeric bumper being greater than the combined thickness of all of said plurality of support plates and the height of said lip;

j. the upper region of said elastomeric bumper being positioned in said elliptical bumper opening of said upper ankle bumper fixture, said upper surface of said elastomeric bumper abutting and being fixedly attached to said top plate of said upper ankle bumper fixture, said lower surface of said elastomeric bumper abutting, being vertically supported by, and being fixedly attached to said lower ankle bumper fixture, and said lower region of said elastomeric bumper being laterally supported by said lip of said lower ankle bumper fixture;

k. said foot being made of flexible foam material and having a cavity formed in the upper region thereof, said bumper assembly being positioned within said cavity wherein said upper ankle bumper fixture is in wedged contact with said foot adjacent to the upper region of said cavity;

l. said shin block, foot, top plate, elastomeric bumper and lower ankle bumper fixture each having an opening for receiving said cable assembly, said openings having coincidental centerlines;

m. said cable assembly positioned within said openings for rigidly interconnecting said shin block, foot and bumper assembly; whereby

n. transverse rotary motion of said foot about the long axis of the shin is allowed when externally applied torque exceeds the opposing, resistive force of said elastomeric bumper; and the restorative force of said elastomeric bumper causes said foot to tend to return to its original at-rest orientation with respect to the long axis of the shin when said externally applied torque is lessened.

3,982,281

HIP-JOINT PROSTHESIS DEVICE

Richard P. Giliberty, 824 Hunt Lane, Manhasset, N.Y. 11030

Filed July 25, 1975, Ser. No. 598,752
Int. Cl.² A61F 1/24
U.S. Cl. 3—1.913 **5 Claims**

1. In a hip-joint prosthesis device of the type surgically implanted in a manually shaped acetabular opening having an assembly of outer and inner spherical cups frictionally engaged about a spherical head of said device, the improvement to said outer spherical cup comprising a cylindrical wall section thereon extending in pending relation beyond said inner cup so as to define a clearance space for settling movement of said device within said acetabular opening, and a laterally oriented lip on said wall section adapted to engage the anatomical bounding structure of said acetabular opening only after said settling movement of said device, whereby said lip is assisted in limiting the settling movement of said device by

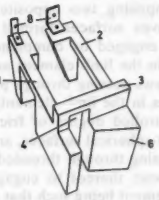
favorable secondary tissue changes occurring in said acetabular opening prior to said engaging contact of said lip.

3,982,282

REDUCING WATER CONSUMPTION IN WATER CLOSETS

Ch'ng Seow Kong, 31, Sennett Terrace, Singapore, Singapore

Filed May 1, 1975, Ser. No. 573,719
Int. Cl.² A47K 17/00
U.S. Cl. 4—1 **4 Claims**



1. Apparatus for reducing water consumption in a water closet associated with a cistern having means for filling the cistern with water to a predetermined level and means for discharging water from the cistern to the water closet, the apparatus comprising a one-piece structure shaped to permit insertion into the cistern without prior removal of any portion of the filling means and the discharging means, and comprising two lateral webs and a cross-piece connecting the two webs, the height of each of the webs being substantially equal to or less than said predetermined water level, the shape of the apparatus being such that it does not interfere with the mechanical operation of the cistern filling means or the cistern discharging means, the apparatus having a predetermined volume substantially at or below said predetermined water level greater than 25% of the total volume of water in the cistern when filled to said predetermined level, whereby the volume of water discharged from the cistern on flushing is reduced by substantially the volume of the structure.

3,982,283

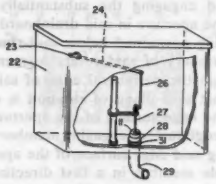
WATER CONSERVING DEVICE FOR FLUSHING APPARATUS

John E. Goldring, Pebble Beach, Calif., assignor to Jegco, Inc., Pebble Beach, Calif.

Filed Apr. 7, 1975, Ser. No. 565,940
Int. Cl.² E03D 1/34
U.S. Cl. 4—67 A **6 Claims**

1. A water saving device for use in conjunction with a water closet buoyant flush valve, comprising a disk formed of a high specific gravity material and adapted to be secured to said

flush valve to reduce the buoyancy thereof, said disk including a hole extending eccentrically therethrough and a slot extending generally radially from side hole to the periphery of said



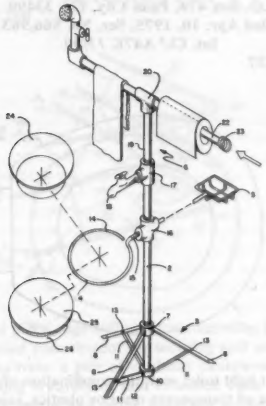
disk, said eccentric hole defining a weakened area in said disk whereby the disk may be deformed to selectively move the opposed surfaces of said slot from and toward each other.

3,982,284

PORTABLE WASH STAND

Sylvester J. Becker, 633 Washington Ave., East Alton, Ill. 62024

Filed Aug. 27, 1974, Ser. No. 500,880
Int. Cl.[2] A47K *3/22*; **A61H** *33/06*
U.S. Cl. 4—145 **15 Claims**



1. A portable wash stand comprising,
base means, said base means comprising a collapsible tripod,
an elongated vertical support member mounted on said base means,
basin and soap dish means pivotally mounted to the vertical support member,
fluid dispensing means operably attached to said vertical support member.

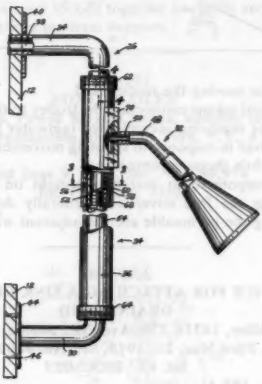
3,982,285

COMBINED GRAB BAR AND SHOWER HEAD FIXTURE

R. Douglas Roberts, Jr., 845 Forest Hills Drive, Nashville, Tenn. 37220

Filed July 17, 1975, Ser. No. 596,834
Int. Cl.[2] B05B *15/06*
U.S. Cl. 4—145 **9 Claims**

1. In a combined grab bar and shower assembly, grab bar means having opposed end regions and an intermediate elongated region extending between said opposed end regions, a pair of fixing means respectively connected operatively with said opposed end regions of said grab bar means for fixing said opposed end regions thereof to a wall with said intermediate region spaced from said wall so as to be accessible to an individual taking a shower, at least one of said end regions of said grab bar means having a hollow interior space which can be placed in communication with a supply of water to be used for shower purposes, shower head means for providing a shower spray, said shower head means also having a hollow interior space, and mounting means operatively connected with said grab bar means and with said shower head means for mounting the latter on said grab bar means with the hollow interior space of said shower head means communicating with the hollow interior space of said one end region of said grab bar means, whereby the assembly forms a combined grab bar and shower fixture, said mounting means including at least a portion of said intermediate region of said grab bar means which is formed with a hollow interior space communicating with said hollow interior space of said one end region of said grab bar means, and said hollow interior of said shower head means communicating with said hollow interior space of said one end region of said grab bar means through said hollow



interior space of said intermediate region of said grab bar means, said mounting means further including a hollow sleeve surrounding and at least partly spaced from said portion of said intermediate region of said grab bar means, said sleeve having opposed ends fluid-tightly engaging said intermediate region of said grab bar means, and the portion of said intermediate region of said grab bar means which is formed with said hollow interior space communicating with said hollow interior space of said one end region of said grab bar means being formed at a wall thereof with at least one opening providing communication between the interior of said sleeve and the interior space of said portion of said intermediate region of said grab bar means, and said shower head means being carried by said sleeve and having its hollow interior space communicating with the interior of said sleeve so that water will flow through the hollow interior space of said one end region of said grab bar means and the hollow interior space of said portion of said intermediate region of said grab bar means through said opening into the interior of said sleeve to be received therefrom by the hollow interior space of said shower head means.

3,982,286

SWIMMING POOL COVER

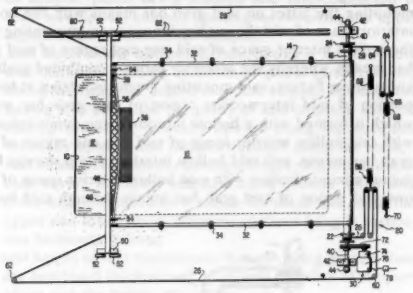
Elton Gordon Foster, 2034 Dryden Road, Houston, Tex. 77025

Filed Oct. 15, 1974, Ser. No. 514,754
Int. Cl.[2] E04H *3/19*, *3/16*; **F16L** *21/02*
U.S. Cl. 4—172.14 **11 Claims**

1. A swimming pool cover comprising

a reel having a water-impermeable cover spooled thereon providing a water permeable section adjacent the free end thereof;

means operatively connected to the cover for spooling and unspooling the same across a swimming pool including a trolley above the surface of water in the pool for traversing the pool,



means for moving the trolley, and

attachment means connecting the trolley to the cover; and

means for removing accumulated rainwater from the top of the cover in response to spooling movement while retaining debris thereon comprising

means responsive to increased weight on the cover for moving the free cover end generally downwardly and placing the permeable section adjacent water level.

3,982,287

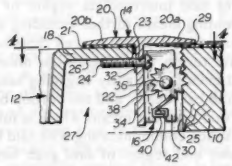
DEVICE FOR ATTACHING A SINK RIM TO A DRAINBOARD

Howard Miller, 14316 37th Ave. NE., Seattle, Wash. 98125

Filed Mar. 21, 1975, Ser. No. 560,871

Int. Cl.[2] E03C *1/33*

U.S. Cl. 4—187 A **16 Claims**



1. In an apparatus for attaching a sink assembly to a horizontally disposed drainboard, said drainboard having an upper surface and an aperture therein for receiving said sink, the periphery of said aperture being defined by inwardly facing, substantially vertical edge surfaces on said drainboard, said sink assembly including a sink having an upper, peripheral rim flange and including a peripheral, horizontally disposed, rim member and means operably connecting said rim member to the peripheral flange of said sink, said rim member being so constructed to overlie and engage the upper surface of said drainboard adjacent said aperture and being so constructed and associated with said sink to support the weight of said sink when said sink is inserted in said aperture, said rim member having an outer peripheral edge, said sink assembly being adapted for insertion in a downward direction into said aperture, an improvement in said apparatus for preventing upward retrograde movement of said sink assembly from said aperture once said sink assembly is inserted into said aperture, comprising:

a rotatable member and means for mounting said rotatable member to said sink assembly, said rotatable member having a periphery and a plane of rotation, the periphery of said rotatable member having members thereon for gripping and engaging the substantially vertical edge surface of the aperture in said drainboard, said rotatable member being positioned below said rim member such that the periphery of said rotatable member is spaced inwardly from the peripheral edge of said rim member and such that said plane of rotation is oriented transversely to the edge surface of the aperture in the drainboard, said edge surface engaging members being capable of contacting said edge surface of the aperture to rotate said rotatable member in a first direction as said sink assembly is inserted into said aperture, said rotatable member, including said edge surface members on the periphery thereof, and said means for mounting said rotatable member being so constructed as to move said edge surface engaging members on the periphery of said rotatable member outwardly towards said edge surface of said aperture as said rotatable member rotates, and

means operatively associated with said rotatable member for preventing said rotatable member for rotating in a direction opposite to said first direction.

3,982,288

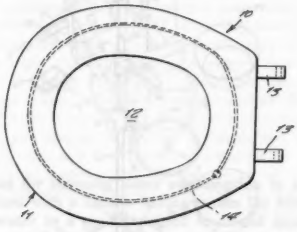
NIGHT LIGHT TOILET SEAT

Mel Borne, P.O. Box 474, Palm City, Fla. 33490

Filed Apr. 10, 1975, Ser. No. 566,963

Int. Cl.[2] A47K *13/00*

U.S. Cl. 4—237 **3 Claims**



1. In a night light toilet seat, the combination of a toilet seat member made of transparent resin or plastics, said toilet seat having hinged plates secured to a rear end thereof for pivoting said toilet seat member between an upwardly vertical, non-use position and a horizontal utility position, and means being provided whereby said toilet seat member is illuminated; said means comprising a clear lucite rod being cast within an interior of said toilet seat member, the opposite ends of said lucite rod extending outwardly of an underside of said toilet seat member and aligned with a light source means.

3,982,289

DISPOSABLE SINK STRAINER

David Robbins, 123 W. 75th St., New York, N.Y. 10023

Filed Apr. 10, 1975, Ser. No. 567,039

Int. Cl.[2] E03C *1/26*

U.S. Cl. 4—292 **6 Claims**

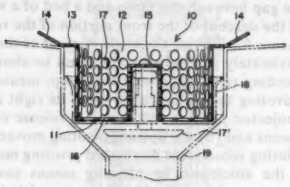
1. A disposable sink strainer adapted to be mounted on top of a conventional sink basket in a sink and removed therefrom, comprising:

a cylindrical portion having a plurality of openings therein forming a plurality of vertical columns;

a bottom portion substantially constituting a disc and integrally connected and depending from a lowermost portion of said cylindrical portion, said bottom portion being formed with a plurality of holes therein;

said cylindrical walls being of a size adapted to fit complementarily in said conventional sink strainer;

a rim extending horizontally and radially outwardly and integrally from an uppermost portion of said cylindrical



portion and adapted to snugly engage the sides of the base of said sink; and

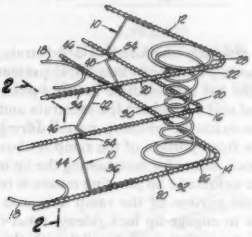
means integrally connected with said rim to remove said disposable sink strainer from said conventional sink strainer and sink.

3,982,290

MATTRESS EDGE STIFFENER

James T. Ward, 1418 N. Potrero Ave., South El Monte, Calif. 91733

Filed May 8, 1975, Ser. No. 575,979
Int. Cl.² H47C 23/02
U.S. Cl. 5—260 6 Claims



1. A single piece edge stiffener for mattresses having means at the extended ends thereof for securing said stiffener to the edge of a mattress, a pair of coplanar cantelever spring portions extending inwardly of said extended ends from each of said securing means and being integrally joined at the inner ends thereof in a substantially semi-circular anchor loop, said anchor loop being open at its inner end and coplanar with said cantelever spring portions and adapted to be disposed about a portion of said mattress.

3,982,291

BED FRAME LOCKING ASSEMBLY AND METHOD

Frank M. Damico, Hull, Mich., assignor to Joerns Furniture Company, Stevens Point, Wis.

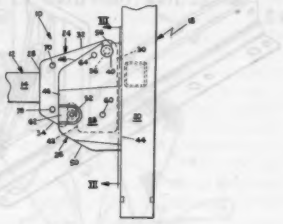
Filed June 23, 1975, Ser. No. 589,375
Int. Cl.² A47C 27/08
U.S. Cl. 5—294 23 Claims

1. A bed frame locking assembly for attaching a support frame to a mattress support comprising:

first and second rigid, opposing brackets;

pivot means on at least one of said brackets for supporting the other of said brackets for pivotal movement with respect to the one bracket;

rigid connection means on at least one of said brackets for engaging the other of said brackets and receiving means on the other of said brackets for receiving said connection means; the engagement of said connection and receiving means preventing pivotal movement of said brackets with respect to each other when said pivot means is supporting said other bracket; and



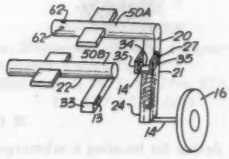
camming means for camming said connection means into said receiving means when said brackets are pivoted with respect to each other about said pivot means whereby said brackets are locked together to rigidly secure a support frame to a mattress support.

3,982,292

BOAT TRAILER

Leo D. Johnson, Powell River, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed June 9, 1975, Ser. No. 584,974
Int. Cl.² B60C 13/00
U.S. Cl. 9—1.2 4 Claims



1. A wheel attachment assembly adaptable for detachably fastening of a wheel to a boat comprising

a pair of female sockets mounted laterally, a spaced distance apart, to one side of a boat,

a pair of male plugs, each shaped to matingly engage an individual said female socket,

a wheel and axle unit fixed to a support member fixed to a first said male plug, said support member fitted with a first bracket, with

the second said male plug fixed to a second bracket,

said first and second brackets fitted with detachable means to engage and attach to each other.

3,982,293

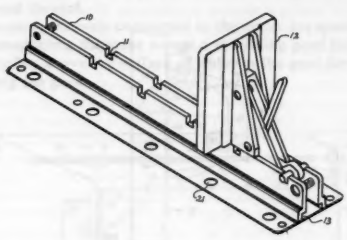
FOOT RESTS FOR KAYAKS

Otto Leonard Lagervall, 724 N. 34th Ave., Yakima, Wash. 98902

Filed Mar. 31, 1975, Ser. No. 563,346
Int. Cl.² B63B 29/00
U.S. Cl. 9—7 4 Claims

1. A foot rest assembly for kayaks, comprising a pair of foot rest units, one unit adapted to be secured to each side of the hull inside the front of the kayak, each unit comprising a base and a pair of channel members with longitudinally spaced indexing slots, the members rising upwardly from the base and forming an inverted T-slot, said members serving as a track

and support for a foot pad assembly, the foot pad assembly comprising a hollow I-beam supporting a foot pad and a



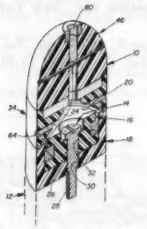
spring-actuated trigger connected to an indexing pin, said pin being adapted to engage a given pair of indexing slots.

3,982,294

RETRIEVER

Emerald W. Hicken, 236 E. El Paso, Broken Arrow, Okla. 74012

Filed Oct. 9, 1975, Ser. No. 621,210
Int. Cl.² B63C 7/26
U.S. Cl. 9—9 **7 Claims**



1. A retriever device for locating a submerged object comprising:

a base member axially threaded with left hand threads,

a spool positioned on the base member and being axially threaded with left hand threads,

a screw member holding the spool and base member in secure position against the object and having contiguous right and left hand threads,

a retaining member mounted on the base member including a partition having an axial opening, a flat upper surface, being thicker near its perimeter than adjacent said opening, and having a transverse opening from an outer edge to the axial opening,

a float member secured to the retaining member by water-soluble adhesive means, and

a line, having a first end attached to the float, passing through the axial opening of the retaining member, and having a second end attached to the spool.

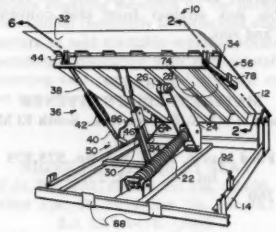
3,982,295

DOCK LEVELING APPARATUS

Peter B. Burnham, Columbus, Ohio, assignor to Harsco Corporation, Camp Hill, Pa.

Filed May 21, 1975, Ser. No. 579,686
Int. Cl.² B65G 11/00
U.S. Cl. 14—71.5 **12 Claims**

8. In the combination of dock leveling apparatus associated with a loading dock which is designed for loading and unloading vehicles; the loading dock having a generally planer upper surface; the apparatus including a ramp having front and rear portions and pivotally mounted at its rear portion; means associated with the ramp for releasibly blocking the upward movement of the ramp; means for pivoting the ramp upward upon release of said blocking means; lip means pivotally attached to the front portion of the ramp, said lip being for bridging the gap between the ramp and a bed of a vehicle and for limiting the descent of the front portion of the ramp below said bed; means for limiting the angle of pivot of the lip means from approximately parallel with the ramp to about a downwardly extending right angle with the ramp; means for automatically pivoting the lip upwardly from its right angle position to a projected position following (a) release of the ramp blocking means and (b) the upward pivoting movement of the ramp and during subsequent downward pivoting movement of the ramp; the automatic lip pivoting means comprising a straight arm pivoted from both ends, one end being pivoted from the lip and the other end pivoted from a short bar, the



short bar being pivotally anchored to a substrate, said substrate being stationary relative to said dock, projecting means extending from the bar intermediate its pivot points for limiting the pivoting of said bar toward the substrate and means for releasing the automatic lip pivoting means during the ramp descent while the front portion of the ramp is above the level of the dock; lip lock means for maintaining the lip in projected position after the automatic lip pivoting means is released and until (1) the front portion of the ramp descends below the level of the dock to engage lip lock release means or (2) the lip is pivoted to a position near parallel with the ramp; the improvement comprising:

the projection means extending from the bar is adjustable in length to cooperatively coordinate the release of the automatic lip pivoting means with the time the lip lock means is positioned to support the lip in projected position.

3,982,296

HAIR BRUSH AND COMB CLEANING APPARATUS

Doris A. Russo, 24 W. Hill Drive, Los Gatos, Calif. 95030

Division of Ser. No. 376,629, July 5, 1973, Pat. No. 3,879,787.
This application Feb. 18, 1975, Ser. No. 550,843
Int. Cl.² A46B 13/04; A45D 24/40
U.S. Cl. 15—38 **3 Claims**

1. A hair brush and comb cleaning and disinfecting apparatus, comprising:

a. a base member;

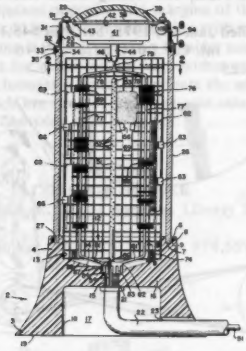
b. a hollow body sealingly supported on the base member and within which brushes and combs to be cleaned and disinfected are adapted to be supported;

c. a cover assembly closing the end of the hollow body remote from the base member to prevent the escape of cleaning and disinfecting fluids from said hollow body;

d. fluid delivery means projecting into said hollow body and adapted to disperse a cleaning and disinfecting fluid radially outwardly onto the brushes and combs to be cleaned;

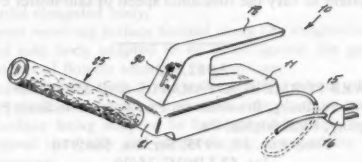
e. rack means within said hollow body disposed about said fluid delivery means and on which brushes and combs to be cleaned are adapted to be detachably secured;

f. means associated with said base member for draining said cleaning and disinfecting fluid from the interior of said hollow body; and



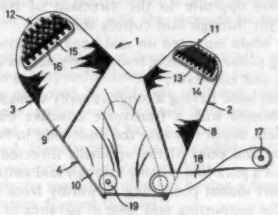
g. motor means supported on said hollow body, and abrading means depending into said hollow body and adapted for rotation by said motor means to abrade the bristles and tines of brushes and combs supported within the hollow body.

3,982,297
AUTOMATIC CLEANER
Carl Belluomo, 248 Brinsmade Ave., Bronx, N.Y. 10465
Filed May 27, 1975, Ser. No. 580,665
Int. Cl.² A46B *13/02*
U.S. Cl. 15—97 R **3 Claims**



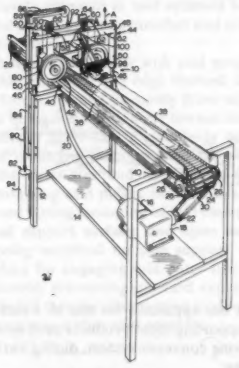
1. In a portable power tool adaptable for use as an automatic cleaner, the combination of a case integral with a handle, an electric motor inside said case being connected to an extension cord protruding outwardly to said case and fitted with a male plug, a shaft of said motor having a bevel first gear mounted thereupon, said first gear engaging a bevel internal second gear having a hub protruding outwardly through a front wall of said case, said hub being journalled in a bearing opening of said wall, an outer end of said hub having a square socket opening, and a plurality of rollers selectively engagable in said socket opening; each said roller comprising a core fitted with a sleeve of a material for frictionally rubbing against a work, and a shaft secured inside said core protruding from a rear end thereof for engaging said socket opening, said rear end of said core having a concentric, hollowed out recess through a center of which said roller shaft extends and wherein said roller shaft has an annular groove within said recess which is engagable by a detend support on said case, said detend comprising an offset member transversely slidable respective to an axis of said roller shaft, said detent being slidable in an opening in a protrusion formed on said front wall, and a compression coil spring between said protrusion and a right angle portion of said offset member normally urging said detent to engage said annular groove.

3,982,298
MITT TYPE SHOE CLEANER
Tunezo Ota, 10-21 Koshien-cho, Nishinomiya, Hyogo, Japan
Filed Sept. 24, 1975, Ser. No. 616,499
Int. Cl.² A41D *19/01;* **A47L** *23/10*
U.S. Cl. 15—106 **8 Claims**



1. A mitt type shoe cleaner comprising in combination,
a body comprising a relatively small first hollow portion into which the thumb is to be inserted, a relatively large second hollow portion into which the remaining four fingers are to be inserted, and a separate central portion located between and connecting said first and second hollow portions together at the front side of the body;
a first brush attached to the tip portion of said first hollow portion at the front side thereof; and,
a second brush attached to the tip portion of said second hollow portion at the front side thereof;
said first and second hollow portions being formed of a non-elastic flexible material, and said central portion being formed of an elastic flexible sheet material.

3,982,299
MEAT CUTTER
Louis Kompan, Kitchener, Canada, assignor to Burns Foods Limited, Kitchener, Canada
Filed May 1, 1975, Ser. No. 573,728
Int. Cl.² A22B *5/20*
U.S. Cl. 17—1 R **5 Claims**



1. A device for removing the backbone from a loin of pork comprising,
a. a conveyor assembly adapted to move a loin of pork through a cutting station with the backbone portion of the loin upwardly disposed and extending longitudinally of the conveyor,

b. a cutter assembly in said cutting station and disposed above said conveyor comprising,

i. a cutter head mounted for movement upward away from and downwardly towards a predetermined plane disposed above said conveyor, said head being biased for movement downwardly towards said predetermined plane, said head having a leading end disposed in a direction opposite to the direction of travel of the conveyor through said cutting station,

ii. a saw blade mounted on said head for movement in a cutting plane extending transversely across and spaced above said conveyor,

iii. a guide shoe having a longitudinally elongated underside formed with a transverse concave curvature of sufficient depth to cause the underside to bear against the top and sides of the upwardly directed backbone ridge of a pork loin passing through said cutting station,

iv. support means projecting forwardly from said cutter head for supporting said shoe in advance of said cutter head such that the vertical movement of the shoe results in a vertical movement of the head,

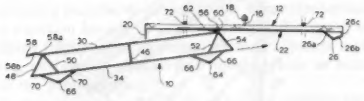
v. mounting means connecting said shoe to said support means to permit movement of said shoe means in a direction transverse to the path of travel of the conveyor and about a vertical and a horizontal axis whereby the shoe may move to follow the longitudinally transverse curvature of the backbone and the longitudinally vertical curvature of the backbone to cause the cutter head and thereby the saw blade to be raised and lowered to follow the longitudinal vertical curvature of the backbone to provide a cut of uniform depth along the full length of the loin as it is driven through the cutting station.

3,982,300

HANGER FOR SMOKE HOUSE

Anthony Joseph Soikie, 234 Union St. East, Waterloo, Ontario; Leon Jaskulski, 7 Wareside Road, Etobicoke, Ontario, and Knud Erik Hansen, Unit 44, 3525 Brandon Gate Drive, Mississauga, Ontario, all of Canada

Filed Mar. 18, 1975, Ser. No. 559,526
Int. Cl.[2] A22C *15/00*
U.S. Cl. 17—44.4 **15 Claims**



1. Support bar apparatus for use in a side-loading hanger system for supporting meat products such as sausages and the like on a moving conveyor system, during curing, said apparatus comprising;

a support bar adapted for attachment to said conveyor system, said bar defining two ends;

eye means at one said end of said bar;

catch means at the other said end of said bar, and,

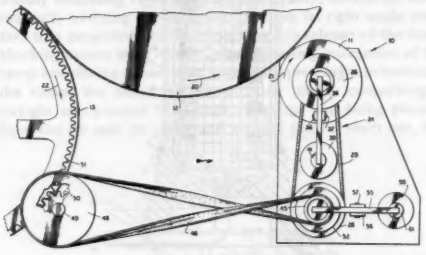
guide rod means located substantially alongside but spaced from said support bar, said guide rod means having two ends, one said end being attached to said catch means and the other said end to said support bar.

3,982,301

VARIABLE DRIVE MECHANISM FOR CARDING MACHINE

Lawrence Llach, Rte. 6, Oakdale Road, Canton, Ga. 30114, and Arturo Picas, 150 Viking Court No. 4, Athens, Ga. 30601

Filed Jan. 29, 1975, Ser. No. 545,195
Int. Cl.[2] D01G *31/00, 15/46*
U.S. Cl. 19—.25 **3 Claims**



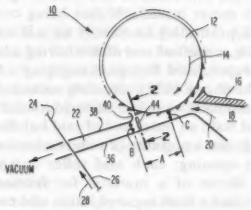
1. In a high production textile card system including a main cylinder, a licker-in cylinder and a doffer cylinder for working fibrous textile material and forming the textile material into a sliver and drive means for driving the main cylinder and the licker-in cylinder, the combination therewith of a variable width sheave belt drive system connected to and continuously driven by a sheave powered from said licker-in cylinder and including a driven variable width sheave, a second belt drive system connected in rotational driving relationship to said doffer cylinder and including a driving pulley, clutch means selectively interconnecting said driving pulley of said second belt drive system and said driven variable width sheave of said variable sheave belt drive system, and time controlled actuating means for engaging and disengaging said clutch means to start and stop the rotation of said doffer cylinder and for varying the width of a sheave of said variable width sheave belt drive system to vary the rotational speed of said doffer cylinder.

3,982,302

WEB FORMING APPARATUS AND METHOD

Lawrence Vaalburg, Brookhaven, Pa., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Apr. 10, 1975, Ser. No. 566,970
Int. Cl.[2] D01G *25/00*
U.S. Cl. 19—156.3 **12 Claims**



1. An apparatus for forming a fibrous web from a gaseous suspension of fibers, said apparatus including a fiberizing roll for separating fibers from a fibrous feed mat and entraining said fibers in a gaseous medium, a foraminous forming surface through which the gas of said suspension passes and upon which said fibers are condensed to form said fibrous web, a formation duct having an upstream end adjacent the fiberizing roll and and a downstream end adjacent the forming surface for providing a flow path for the gaseous suspension of fibers

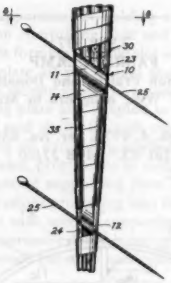
from said fiberizing roll to said forming surface; the improvement including a pair of passageways adjacent the upstream end of the formation duct, each passageway extending through a formation duct wall and said passageways being located only adjacent opposite side margins of the formation duct, and vacuum means communicating with said passageways for creating a lower pressure outside said duct than inside said duct for removing air from within upstream side margins of said formation duct to eliminate the adverse effect of vortices which are created adjacent said side margins by rotation of the fiberizing roll.

3,982,303

CORSAGE HOLDER

Robert A. Shulkin, E. 24122 Sprague, Liberty Lake, Wash. 99012

Filed Apr. 23, 1975, Ser. No. 570,559
Int. Cl.² A45F *5/08*
U.S. Cl. 24—6 **5 Claims**



1. A corsage holder, comprising:
a solid elongated body;
a stem receiving surface formed along one longitudinal side of said body adapted to be fitted against the gathered stems of flowers arranged in a corsage;
a tape receiving surface on the longitudinal side of said body opposite to said one longitudinal side; the tape receiving surface being adapted to be engaged by tape wrapped about the body and stems during construction of the corsage;
opposed longitudinal side edges joining the stem and tape receiving surfaces;
an open transverse aperture formed through the body, extending in open communication from one side edge to the other, the aperture being adapted to receive a corsage pin for fixing of the corsage to the clothing; said aperture beind inclined diagonally across the longitudinal sides of the body.

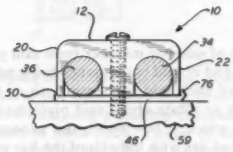
3,982,304

PLASTIC CLAMPING APPARATUS

Arnold Menshen, Beuler-Weg 52, Neuenrade Westphalia, Germany

Filed Dec. 11, 1974, Ser. No. 531,470
Int. Cl.² F16L *3/22;* **A44B** *21/00*
U.S. Cl. 24—73 AP **1 Claim**

1. Integrally molded plastic clamping apparatus for securely clamping longitudinally extending members on a support surface, comprising:
1. a plastic body including:
a. a base portion,
b. a pair of side walls extending from the side edges of said base portion and formed integrally therewith,
c. a pair of end walls extending from the end edges of said base portion and extending between the ends of said side walls and formed integrally with said base portion and said side walls,
d. each of said side walls having a plurality of recesses formed therein extending from the outer frec edge of the respective side wall towards said base portion, said recesses for receiving said longitudinally extending members and the recesses in each side wall being in coaxial alignment with the recesses in the other side wall,
e. a fastener guide post formed integrally with and extending perpendicularly from said base portion and being enclosed by said side wall and end walls, said fastener guide post disposed between said coaxially aligned recesses and having a fastener receiving bore formed therethrough and extending perpendicularly with respect to said base portion;
2. a flat plastic mounting member having a fastener receiving aperture formed therein;
3. a plastic hinge portion formed between and integrally with an end edge of said mounting member and the outer free edge of one of said end walls;
4. said plastic being sufficiently flexible to permit said body to pivot through more than 90° away from said mounting member by said hinge portion to permit said coaxially aligned recesses to receive said longitudinally extending



members and to permit said body to pivot toward said mounting member and permit the outer free ends of said side and end walls to engage said mounting member and to permit said bore and said aperture to be coaxially aligned, whereby upon a fastener extending through said coaxially aligned bore and said aperture and engaging said support surface, said longitudinally extending members are securely clamped in said recesses between said side walls and said supporting member and are secured to said support surface;
5. a plastic tab formed integrally with said mounting member and at the outer free end edge thereof, said tab providing a surface extending upwardly from said mounting member and being inclined slightly toward said mounting member whereby upon said plastic body being pivoted towards said mounting member, said tab slightly interferes with the outer free end wall of said plastic body thereby maintaining said plastic body and said mounting member closed during mounting of said clamping apparatus upon said support surface, and upon said clamping apparatus being mounted on said support surface said inclined surface for engaging said outer free end wall of said body thereby preventing outward expansion of said free end wall and thereby maintaining said longitudinally extending members within said recesses.

3,982,305

SHOULDER STRAP HOLDER PIN

Ruth Meyer, Brooklyn, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Sept. 9, 1975, Ser. No. 612,013
Int. Cl.² A44B *21/00*
U.S. Cl. 24—85 R **2 Claims**

1. An assembly adaptable for fastening to a garment over an external surface of said garment for the purpose of retaining

a strap in detachable engagement over the garment comprising,

a flexible strap adaptable for suspension of a bag,

a frame member in the form of a U-shaped section formed with two generally parallel spaced leg sections joined to a common base section, at a first end of each leg section,

means fixed to the frame member for attachment of the assembly to a garment with the underside of the assembly lying adjacent the garment, and

a bar member pivotably mounted to the frame member between the said leg sections of the frame member so as to rotate in a plane perpendicular to the plane of the axes of the said leg sections, with the said bar member fitted, adjacent a first end, to pivot means joined to each of said leg sections adjacent to the second end of each leg section, with

the length of said bar member from said pivot means to the second end of said bar member being not greater than the length of each said leg section, so as to permit the bar member to rotate about said pivot means to a rest position in which it lies within the general confines of the frame and lies with the axis of the bar member parallel to the axes of the said leg sections,

said bar member being spaced from each leg section, in said rest position, by the general thickness of said strap, so that the strap. when passed over the outer side of the assembly about each leg member and under the underside of the assembly about the bar member, is frictionally engaged to the frame member,

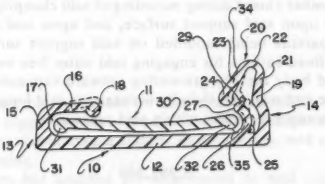
said engaged strap being releaseable from engagement to said frame member, by manual rotation of the bar member away from the underside of the said frame member.

3,982,306

FASTENER FOR PLASTIC FILM SHEETING AND THE LIKE

Walter J. Curry, 337 Roberta Ave., Winnipeg, Manitoba, Canada

Filed July 7, 1975, Ser. No. 593,675
Int. Cl.² A44B *21/00*
U.S. Cl. 24—243 K **8 Claims**



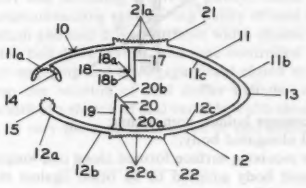
1. A clamping and holding assembly for flexible plastic film sheeting and the like, comprising in combination an elongated flexible channel member, an elongated locking strip detachably engageable within said channel member for clamping the associated film sheeting therebetween, and means cooperating between said locking strip and said channel member for detachably securing said strip within said channel member, said channel member including a base and a pair of side walls extending upwardly from said base one upon each side edge thereof, one of said side walls extending upwardly and then inwardly of the corresponding side edge of said base and an elongated bead formed on the inner edge of said one side wall, the other of said side walls having a portion extending upwardly from the corresponding side edge of said base and then curving over and having a portion which extends downwardly towards said base, a longitudinally extending bead formed on the inner edge of said portion of said other side wall which extends downwardly towards said base as aforesaid, and an elongated expansion member extending upwardly from said base inwardly of said other side wall and terminating spaced from said longitudinally extending bead of said other side wall and between said last mentioned bead and the portion of the other side wall extending upwardly from said base, the width of said locking strip being greater than the width between said beads whereby said bead of said other side wall is temporarily displaced outwardly as said locking strip engaged within said channel member.

3,982,307

FABRIC CLAMP

Gordon E. Smith, Sun Prairie, and Donald L. Evans, Lake Windsor, both of Wis., assignors to Med-Pro, Ltd., Sun Prairie, Wis.

Filed Feb. 4, 1976, Ser. No. 655,202
Int. Cl.² A44B *21/00*
U.S. Cl. 24—255 SL **14 Claims**



1. A fabric clamp comprising:

a. two arcuate members having fixed ends joined together, said arcuate members extending from said fixed ends in spaced outwardly bowed relation to free ends positioned in normally spaced relation, said arcuate members being formed of a flexible and resilient material to allow them to be displaced toward one another to cause engagement of said free ends and to allow the non-joined portions of said arcuate members to be displaced laterally with respect to one another;

b. a concave surfaced jaw on the free end of one of said arcuate members, the concave surface of said jaw facing said other free end;

c. a convex surfaced jaw on the free end of the other of said arcuate members, the convex surface of said jaw facing said concaved surfaced jaw;

d. a first latch member extending inwardly from one of said arcuate members and having a longitudinal projection on the end thereof; and

e. a second latch member extending inwardly from the other of said arcuate members and having a longitudinal projection on the end thereof in position to overlap and engage with the projection on said first latch member when said arcuate members are displaced toward each other to a closed position to maintain said concave and convex surfaced jaws in mating engagement;

f. said jaws and said latch member longitudinal projections being laterally unobstructed whereby said jaws may be released to their normally open position by laterally dis-

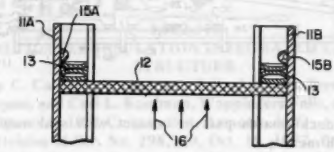
placing said arcuate members until said projections on said latch members are no longer in overlapping engagement.

3,982,308

SEMICONDUCTOR DEVICE CLAMPING APPARATUS

Yoshitada Yoneda, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 27, 1975, Ser. No. 608,302
Int. Cl.² H01R 13/54; H01V 7/00; H01L 23/42
U.S. Cl. 24—263 R 4 Claims



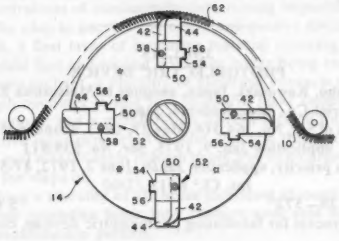
4. A clamping apparatus for holding a semiconductor device in compression comprising: first and second hollow supporting shafts, walls forming an axial slot in each of said shafts, a first supporting plate affixed to said shafts and holding said shafts in parallel, a second supporting plate spaced apart from said first supporting plate and adapted to slidably engage the hollow interior of said shafts through said axial slots, spring means for receiving an externally applied compressive force exerted on said plates, protrusions in said walls of said shafts for holding said second supporting plate in a predetermined position, said protrusions projecting into the hollow interior of said shafts to abut said second supporting plate, whereby a predetermined compressive force is maintained on a semiconductor device disposed between said plates.

3,982,309

METHOD OF PROVIDING CUT LOOP PILE FABRICS

Michael William Gilpatrick, Chesnee, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 542,111, Jan. 20, 1975. This application Aug. 8, 1975, Ser. No. 603,069
Int. Cl.² D06C 13/08
U.S. Cl. 26—9 1 Claim



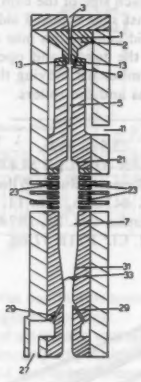
1. The method of providing a cut loop fabric from a loop fabric having a backing material on a machine having a rotor in which is mounted a plurality of rows of cutting modules, the module of each of said rows each having a plurality of guard members between which are recessed cutting blades with the guard members projecting beyond the extent of the cutting blades, the method comprising the steps of: rotating the rotor, passing the loop pile fabric into contact with the rotating rotor so that the guard members contact the backing material to prevent the cutting blades from cutting the backing material while they cut the loops of the loop pile fabric and taking up the fabric after the loops have been cut.

3,982,310

YARN CRIMPING PROCESS AND APPARATUS

David Ernest Beck, and Derek Walter Thom, both of Pontypool, England, assignors to Imperial Chemical Industries, London, England

Filed Dec. 5, 1974, Ser. No. 529,786
Claims priority, application United Kingdom, Dec. 7, 1973, 56774/73
Int. Cl.² D02G 1/20, 1/16, 1/12
U.S. Cl. 28—1.3 2 Claims



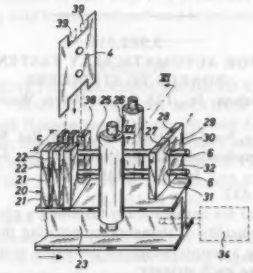
1. In a yarn crimping apparatus comprising in sequence an inlet conduit for yarn, hot fluid forwarding means, a throat conduit for yarn and fluid, and a stuffing chamber for a pad of yarn having means to allow radial escape of hot fluid, the improvement being comprised in that the crimping apparatus has control means comprising in combination a mechanical restricting means comprising a conical restricting outlet to the stuffing chamber and means toward the yarn exit end of the impinging apparatus to inject a cold fluid into the stuffing chamber.

3,982,311

CONVECTOR FOR HEATING BUILDINGS AND TOOLS AND METHOD FOR MANUFACTURING CONVECTOR MODULES FOR SUCH CONVECTORS

Gunnar Olaf Vestergaard Rasmussen, Rydsavej, 38, Parup, DK-5000 Odense, Denmark

Division of Ser. No. 316,491, Dec. 19, 1972, Pat. No. 3,844,340. This application June 28, 1974, Ser. No. 484,467
Claims priority, application Denmark, Dec. 20, 1971, 6237/71; Dec. 8, 1972, 6132/72
Int. Cl.² B23P 21/00
U.S. Cl. 29—33 G 13 Claims



1. In an apparatus for manufacturing convector modules for a convector, a tool for mounting lamella bodies on tubes in the convector modules, each of said convector modules including

at least two throughextending heat conducting horizontal tubes and a plurality of lamella bodies, said lamella bodies being mounted on the tubes and having parallel side lugs initially extending transverse to said tubes, said tool comprising tube carrying means for supporting the tubes onto which the lamella bodies are to be mounted; a movable cam member having parallel slots located one behind the other for transporting the lamella bodies with the side lugs of the lamella bodies exposed, said cam member comprising plural cam bodies providing recesses to receive said tubes; vertical bending rollers situated on each side of the cam member and being disposed to press against said exposed side lugs for bending the side lugs against said cam bodies into a position in which they are parallel with the tubes; and operating means connected to said cam member for moving the latter relative to the tube carrying means and the rollers.

3,982,312

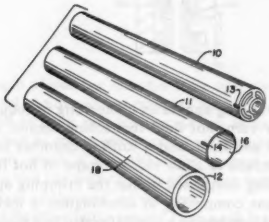
TUBULAR ROLLER SLEEVE

John O. Finzer, 1107 Ramona Road, Wilmette, Ill. 60091

Division of Ser. No. 441,326, Feb. 11, 1974, Pat. No. 3,877,125. This application Oct. 21, 1974, Ser. No. 516,585

Int. Cl.² B21B *31/08*

U.S. Cl. 29—130 **3 Claims**



1. A printers roller including a metal core having a smooth outer peripheral surface of a certain diameter and continuous from end to end of the core, a tubular sleeve having a smooth internal surface of an inside diameter providing a close fit on the outer surface of said core and extending continuously substantially from end to end of said core, a tubular rubber sleeve vulcanized on the outer surface of said tubular sleeve and having a finish ground smooth outer surface and extending continuously substantially from end to end of said tubular sleeve, and removable means releasably securing said tubular sleeve on said core whereby said sleeve and the tubular rubber sleeve may be removed from the metal core as a unit, said means including a slot in the tubular sleeve at one end and a recessed way in the metal core at one end providing registering keyways in the tubular sleeve and in the metal core, and a removable key in said keyways.

3,982,313

METHOD FOR AUTOMATICALLY FASTENING DECK BOARDS TO STRINGERS

William B. Nelson, Jr., 125 Sunset Drive, West Monroe, La. 71291

Division of Ser. No. 538,910, Jan. 6, 1975, Pat. No. 3,957,191. This application Jan. 8, 1976, Ser. No. 648,033

Int. Cl.² B23P *11/00*

U.S. Cl. 29—432 **12 Claims**

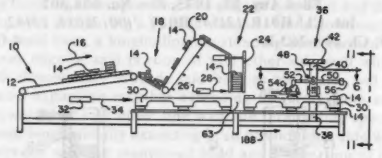
1. A method for automatically fastening a plurality of deck boards to a plurality of stringers, comprising the steps of:

a. providing a counterweighted pivotably mounted fastener gun above each stringer;

b. providing a positioning means on each said fastener gun to automatically raise and lower the position of said fastener gun as the height of the deck board varies, each said counterweight serving to counterweight the combined weight of each fastener gun and each positioning means;

c. providing an automatic firing means for said fastener guns;

d. providing said firing means with a plurality of automatic switch means, responsive to the forward motion of the deck boards, for automatically firing said fastener guns as



said deck boards pass in contact with said automatic switch means;

e. positioning the plurality of stringers and deck boards beneath the counterweighted fastener guns; and

f. firing the fastener guns by means of the automatic switch means being activated by the forward motion of the deck boards.

3,982,314

METHOD OF PRODUCING TIN COATED STEEL SHEET USED FOR SEAMLESS STEEL CONTAINER

Keiji Ariga; Tadashi Nemoto, and Kenji Yasunaka, all of Kudamatsu, Japan, assignors to Kozo Yoshizaki, Tokyo, Japan

Continuation of Ser. No. 415,018, Nov. 12, 1975, abandoned. This application July 9, 1975, Ser. No. 594,196

Claims priority, application Japan, Nov. 14, 1972, 47-113548; Feb. 12, 1973, 48-16436

Int. Cl.² B22D *11/126*

U.S. Cl. 29—527.4 **3 Claims**

1. A method of producing a tin coated steel substrate used for seamless steel containers comprising coating said steel substrate with 0.01 to 5 g/m² by weight of at least one compound selected from the group consisting of nickel oxide, cobalt oxide, copper oxide, tin oxide and a nickel-sulfur compound to form an intermediate layer, and then electroplating tin on said intermediate layer to form said tin coated steel substrate.

3,982,315

PHOTOELECTRIC DEVICE

Shuji Kubo, Kawasaki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Division of Ser. No. 364,314, May 29, 1973, abandoned. This application Jan. 9, 1975, Ser. No. 539,811

Claims priority, application Japan, June 2, 1972, 47-55284

Int. Cl.² B01J *17/00*

U.S. Cl. 29—572 **5 Claims**

1. A process for fabricating photoelectric devices, comprising:

forming on a semiconductive substrate of one conductivity type having a first carrier concentration of semiconductive layer of opposite conductivity type having a second carrier concentration to define a p-n junction therewith to thereby cause a depletion layer to occur in said layer adjacent said substrate;

etching said semiconductive layer to a depth reaching said substrate and penetrating thereinto to provide a plurality of intersecting grooves to thereby produce a plurality of isolated regions of said opposite conductivity type

applying an insulating layer on said isolated regions and said grooves;

etching said insulating layer to provide exposed areas constituting light-receiving windows on said isolated regions of said opposite conductivity type;

applying a plurality of metal electrodes, a respective one of said electrodes being formed as an ohmic contact on only a portion of said exposed area of said layer on each said insolated region and another respective one of said electrodes being formed as an ohmic contact to said substrate beneath said layer via a respective one of said grooves; and

separating said substrate along grooves.

3,982,316

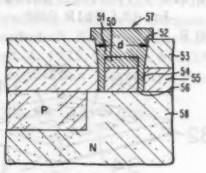
MULTILAYER INSULATION INTEGRATED CIRCUIT STRUCTURE

Harry C. Calhoun, Wappingers Falls; Larry E. Freed, Poughkeepsie, and Carl L. Kaufman, Wappingers Falls, all of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Division of Ser. No. 298,729, Oct. 18, 1972, Pat. No. 3,877,051. This application Nov. 27, 1974, Ser. No. 527,572

Int. Cl.² B01J *17/00*

U.S. Cl. 29—577 **4 Claims**



1. In the method of forming via electrical contacts in a second layer of insulative material covering a planar semiconductor integrated circuit chip structure comprising a planar surface from which a plurality of regions of different types and concentrations of conductivity-determining impurities extend into the chip to provide the active and passive devices of the circuit, a first layer of insulative material covering said surface, said first and second insulative layers being etchable by the same etchant, a plurality of electrical contacts extending through openings in said first insulative layer respectively to said regions, and a metallization pattern formed on said first insulative layer connected to said contacts through said first layer, said metallization pattern being free of enlarged contact pads, the steps of:

etching a plurality of via holes extending through said second insulative layer into contact with said underlying metallizatiion pattern,

and forming a plurality of metallic connectors in and coextensive with said via holes,

said etching step being conducted so that the majority of said via holes have a horizontal dimension at least equal to the horizontal dimension of the directly underlying metallization, and

locating said majority of via holes above integrated circuit surface regions having such impurity types and concentration that would form Schottky Barrier contacts with the type of metal of the connectors in said via holes so that in the event of indadvertant etching through said first insulative layer in forming said majority of via holes, the metal forming said connectors will form a rectifying connection with the exposed surface regions.

3,982,317

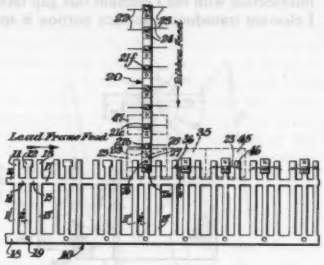
METHOD FOR CONTINUOUS ASSEMBLY AND BATCH MOLDING OF TRANSISTOR PACKAGES

Hubert Eysermans, Manchester, N.H., assignor to Sprague Electric Company, North Adams, Mass.

Filed July 31, 1975, Ser. No. 600,693

Int. Cl.² B01J *17/00*

U.S. Cl. 29—588 **7 Claims**



1. A method for the continuous assembly and batch molding of transistor packages comprising:

a. feeding a set of essentially mutually parallel metal terminals to a predetermined position in a first work station, a plurality of said sets being formed in and being a part of a continuous lead frame, said sets being uniformly spaced, mutually parallel and interconnected by a bottom rail portion of said lead frame, an additional interconnection between the adjacent of said terminals being effected by a web portion of said lead frame intermediate the extreme ends of said terminals;

b. indexing an end portion of a continuous metal carrier ribbon to said first work station at about right angles to the direction of said feeding of said terminals thereto, said carrier ribbon having attached thereto a plurality of uniformly spaced transistor chips, two wires extending from each of said chips in opposite directions in about the plane of and away from said carrier ribbon, said carrier end portion bearing one of said transistors;

c. forming a weld between one of said terminals at said first work station and said carrier ribbon end portion;

d. cutting said carrier ribbon and separating said end portion therefrom;

e. welding one of said wires of said one transistor to an adjacent of said terminals in a second work station;

f. welding the other of said wires of said one transistor to the other adjacent terminal in a third work station;

g. separating from said continuous lead frame a strip portion thereof bearing ten or more of said transistors;

h. simultaneously molding in a multi-cavity mold each of said transistors of said strip in a protective resin; and

i. removing said bottom rail and said interconnecting webs.

3,982,318

MAGNETIC TRANSDUCER HEAD CORE MANUFACTURING METHOD

Douglas Joseph Hennenfent, Minneapolis, and Allan Lawrence Holmstrand, Bloomington, both of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Jan. 29, 1976, Ser. No. 653,578

Int. Cl.² G11B *5/22*

U.S. Cl. 29—603 **8 Claims**

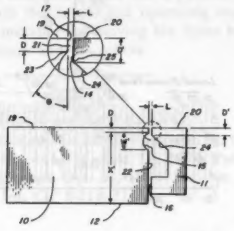
1. In a method for manufacturing a magnetic transducing core comprising C and I elements bonded together and forming a common surface for transducing, and between facing C and I element surfaces intersecting the transducing surface, forming a flux gap in the flux path formed by the elements, an improvement for forming the shallower of the two faces form-

ing the flux gap with a depth equal to a first precisely predetermined distance, and comprising the steps of:

a. before bonding the elements together,

i. machining on the I element a reference surface spaced apart from the transducing surface portion thereon, and

ii. machining along the width dimension of the I element flux gap face a notch whose length is at least the width of the C element's flux gap face and whose line of intersection with the I element flux gap face nearer the I element transducing surface portion is spaced there-



from at least the first predetermined distance and is a second precise predetermined distance from the reference surface;

b. forming the C element with the depth of the flux gap face thereon greater than the first predetermined distance;

c. bonding the C element to the I element to form the flux gap, with one edge of the C element flux gap face opposing and within the notch; and

d. machining the transducing surface until the distance between the transducing surface and the reference surface equals the sum of the first and second predetermined distances.

3,982,319

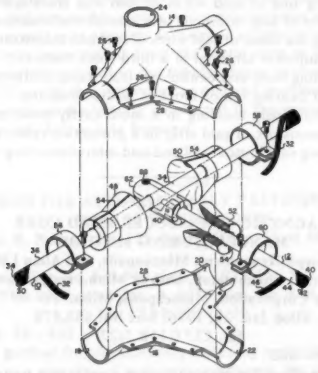
METHOD FOR CONNECTING A TAP ASSEMBLY TO AN ENERGIZED HIGH-VOLTAGE CABLE

Charles D. Bice, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 10, 1975, Ser. No. 540,205

Int. Cl.² H02G *1/14*; H01R *7/04*, *7/20*

U.S. Cl. 29—628 **2 Claims**



1. A method of connecting a concentric tapping cable to an energized high-voltage concentric cable having a semiconductive layer adjacent to the outer conductor of the cable, said method comprising the steps of:

removing the outer conductor of the energized cable from around the cable insulation and the semiconductive layer;

attaching the tapping cable to a clamping means and placing the clamping means around a portion of the energized cable from which the outer conductor was removed;

placing a housng around the cables and the clamping means;

removing the semiconductive layer from a portion of the energized cable located at the side of the housing and the clamping means;

sliding the housing and clamping means along the energized cable until the clamping means is positioned over the portion of the cable from which the semiconductive layer and the outer conductor have been removed;

inserting a tool through an opening in the housing and adjusting the clamping means to provide electrical contact between the inner conductors of the energized and tapping cables; and

injecting an insulating material into said opening to insulate the clamping means from the housing.

3,982,320

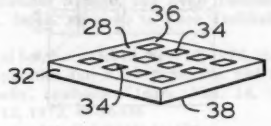
METHOD OF MAKING ELECTRICALLY CONDUCTIVE CONNECTOR

Leonard S. Buchoff, Bloomfield; Joseph P. Kosiarski, Englishtown, and Chris A. Dalamangas, Union, all of N.J., assignors to Technical Wire Products, Inc., Cranford, N.J.

Filed Feb. 5, 1975, Ser. No. 547,346

Int. Cl.² H01R *9/00*

U.S. Cl. 29—630 R **7 Claims**



1. The method of making an electrically conductive connector comprising the steps of:

A. assembling, alternately in parallel relationships, sheets of electrically conductive elastomeric material and sheets of electrically non-conductive elastomeric material into a block structure,

B. slicing from the block a plurality of slabs, each slab containing, alternately, elongated elements of electrically conductive elastomeric material,

C. assembling in parallel relationship said slabs of elongated elements into a stack of slabs, each slab being separated from the adjacent slab by a sheet of electrically non-conductive elastomeric marerial, and

D. slitting a connector element from the stack of slabs in a plane to which the elongated elements of electrically conductive material are essentially normal.

3,982,321

MACHINE AND PROCESS FOR ASSEMBLING CATHODES

Cass S. Kasper, Grosse Pointe, Mich., assignor to Inter-Lakes Engineering Co., Mount Clemens, Mich.

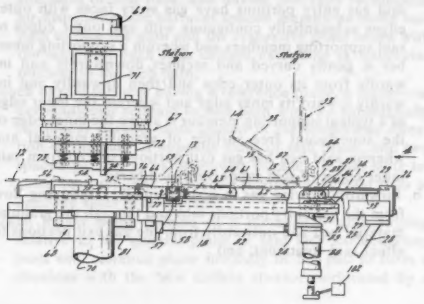
Filed Mar. 24, 1975, Ser. No. 561,615

Int. Cl.² H01B *13/00*; B23P *21/00*

U.S. Cl. 29—624 **9 Claims**

1. In a process for assembling cathodes of the type having a metal sheet, a suspension bar, and a pair of straps connecting said bar and sheet, the steps of moving each sheet singly against stop means, nesting a pair of flat straps in spaced positions parallel to and spaced from said sheet, one portion of each strap extending toward said sheet, placing and retaining a suspension bar over the mid-portions of said straps, holding said one portion of said straps stationary while bending the portions of said straps remote from said sheet up and

over said bar so that the ends of the straps point toward said sheet, bodily moving the subassembly comprising the straps



and bar toward said sheet until the end portions of said straps overlap said sheet, and fastening said overlapping portions of the strap to said sheet.

3,982,322

ARRANGEMENT FOR THE SWITCHING ON-AND-OFF OF A PRESSURIZED MEDIUM FLOW

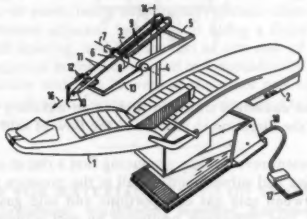
Ernst Otto Fleer, Bensheim-Auerbach, Germany, assignor to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Sept. 4, 1975, Ser. No. 610,253

Claims priority, application Germany, Sept. 12, 1974, 2443708

Int. Cl.² A61C *19/02*

U.S. Cl. 32—22 **8 Claims**



1. In an arrangement for the switching on-and-off of a pressurized medium flow including a valve for receiving said flow from a pressurized medium conduit and for conducting it to an extracting location, the improvement comprising holder means for supporting said valve so as to have the positioning of the latter changeable between two end positions, said valve blocking flow of said pressurized medium in one of said end positions and permitting flow in the other of said end positions; and actuating means operatively connected with said valve so as to effect a positional change of said valve responsive to actuation of said actuating means.

3,982,323

COMBINATION INTERPOLATOR AND DISTANCE DIVIDER

Vuk Zecevic, Chicago, Ill., assignor to Jake Matiosian, Chicago, Ill., a part interest

Filed July 7, 1975, Ser. No. 593,259

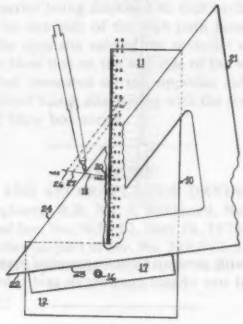
Int. Cl.² G01B *3/00*

U.S. Cl. 33—1 C **1 Claim**

1. A contour interpolator and distance divider instrument comprising

a. a substantially flat body member formed from a molded one-piece L-shaped member providing an elongated leg and a base portion extending at right angles thereto,

b. numerical scales including two sets of a series of numerals, with the series in one set progressively proceeding in an opposite direction along one edge of said elongated leg that joins with the top edge of said base portion,



c. an adjustable instrument support mounted on said base portion providing an elongated supporting edge extending beneath the top edge of said base portion,

d. means connecting said instrument support to said base portion of said body for pivotal movement about a fixed axis, and

e. a straight-edge instrument having one edge positionable upon said support and another edge movable over said numeral scales and said one edge of said leg as said support is pivoted into a predetermined position.

3,982,324

METHOD OF DETERMINING ACTUAL SIZE OF FLOW OPENINGS IN A TUBULAR MEMBER LOCATED IN A WELL

Stanley O. Hutchison, Bakersfield, and Glenn W. Anderson, Oildale, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Dec. 23, 1974, Ser. No. 535,777

Int. Cl.² E21B *47/00*

U.S. Cl. 33—302 **2 Claims**

1. A method of obtaining the actual size of a flow opening in a tubular member located in a well penetrating an underground formation, comprising the steps of inserting into a well adjacent an opening in a tubular member positioned adjacent an underground formation an impression-forming material, said impression-forming material being capable of being at least partially extruded into said opening, contacting said tubular member adjacent said opening with said material for a period of time and at a pressure sufficient to extrude at least a portion of said material into said opening, removing said material containing said extrusion from contact with said tubular member, removing said material containing said extrusion from said well, measuring the size of said extrusion, and

comparing said extrusion with calibrated data of extrusion size vs. actual hole size obtained under simulated well conditions

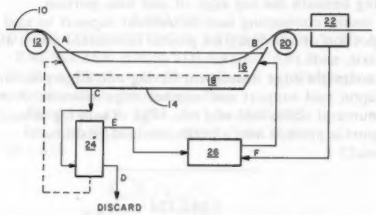
and geometry with an equivalent impression material to determine the actual size of said opening in said tubular member.

3,982,325

METHOD OF SOLVENT DRYING

Wayne C. Sigl, Black Creek, and Frederick O. Lassen, Neenah, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Apr. 30, 1975, Ser. No. 573,065
Int. Cl.² F26B *3/00*
U.S. Cl. 34—9 **7 Claims**



7. In a method of drying a wetted material by solvent exchange including the steps of providing a solvent bath, contacting the wetted material with the solvent bath, and removing the material,

the improvement wherein the solvent bath includes a mixture of solvents partitioned into a plurality of immiscible layers, including a layer tending to maintain a concentration rich in the liquid being removed and wherein the material does not contact the liquid-rich layer.

3,982,326

COUNTERCURRENT CONTACTING OF GAS AND GRANULAR MATERIAL IN PANEL BED

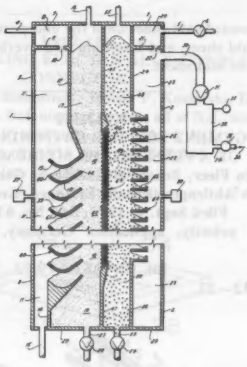
Arthur M. Squires, 245 W. 104 St., New York, N.Y. 10025

Filed Aug. 28, 1974, Ser. No. 501,277
Int. Cl.² F26B *3/00, 5/00*
U.S. Cl. 34—22 **21 Claims**

1. A method of countercurrently contacting gas and granular material with each other to effect physical or chemical treatment comprising:

a. arranging granular material in a bed having a plurality of transversely disposed upwardly spaced gas entry portions separated by interposed supporting members having outer and inner edges with respect to the bed wherein said gas entry portions have gas entry faces with outer edges substantially contiguous with said outer edges of said supporting members and wherein a supporting member is gently curved and inclines downwardly and inwardly from its outer edge and then upwardly and inwardly toward its inner edge and wherein the inner edge of a typical supporting member is above the inner edge of the superjacent free surface of granular material and wherein said bed has gas exit portions spaced from said inner edges of said supporting members;

b. forwardly flowing gas in a substantially continuing flow from the gas entry portions into and through the granular material bed and outwardly from the gas exit portions to effect said treatment; and



c. thereafter causing a transient flow of an auxiliary gas to move in the direction in reverse to the flow of said gas in (b);

d. said transient reverse flow producing first a rise at a given rate of rise and subsequently a fall in the pressure difference between said gas exit portions and said gas entry portions, said difference produced by said transient reverse flow remaining greater than a first critical minimum difference for a time interval of less than about 150 milliseconds, said first critical difference being that difference at which a steady flow of gas in said reverse direction just proudces a localized spill of granular material from said gas entry faces, and said difference produced by said transient reverse flow peaking to a top value beyond a second critical minimum difference, which is the pressure difference at which a transient flow of gas in said reverse direction producing said pressure difference at said rate of rise just initiates a body movement of the granular material toward said gas entry faces to spill a portion of the granular material from the bed.

3,982,327

AIR-DISPENSING WEB-FLOATING APPARATUS

Eugene J. Kurie, Somerville, and Richard J. Yunghahn, Somerset, both of N.J., assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed May 1, 1975, Ser. No. 573,614
Int. Cl.² B65H *17/32*
U.S. Cl. 34—156 **5 Claims**

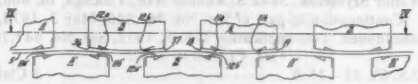
1. In web treating apparatus having means for supporting a

web along a path of movement therefor said apparatus comprising:

a plurality of pressure pads arranged in two series at opposite sides of said path, and having generally rectangular air-dispensing face surfaces spaced lengthwise along said path to face the path and the respective other series with the length of each face surface extending in transverse relation to the web path;

each of said surfaces having a reference plane in transverse perpendicular relation to said path and two substantially rectilinear parallel slots spaced in the lengthwise direction of the path at opposite sides of said plane, and two spaced parallel rows of louvers parallel to said slots located between, and in spaced relation with, said slots at opposite sides of said plane;

each louver being formed of a rectangular area sloping relative to the general plane of said face surface away from said refrence plane inwardly of the pad to form a shoulder with the face surface thereof perforated by a



rectilinear elongate slit-like opening contiguous with the interior of the pad and shaped to direct a jet of air upwardly along said sloped area toward said reference plane;

said slots being defined as substantially continuous slit-like elongate openings oriented and shaped to direct air in a direction generally perpendicular to the associated face surface and said web path, said slots and openings having a width not greater than about 0.06 of an inch, said slots and louver openings being contiguous with a common air-supply plenum region within said pad;

a length of each of the louvers, measured lengthwise of the louver rows, being substantially greater than the spacing between adjacent louvers and being a fixed multiple of such spacing, and the louvers of one row of a pad being staggered in respect to, and in longitudinally overlapping relation with, the louvers of the other row to position in general, each louver of one row opposite a space between louvers of the other row.

3,982,328

DRYER FOR MATERIAL COATED ON TWO SURFACES

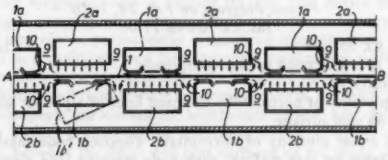
Rune Gustafsson, Stockholm; Ingemar Karlsson, and Rolf Akesson, both of Vaxjo, all of Sweden, assignors to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden

Filed May 28, 1975, Ser. No. 581,578

Claims priority, application Sweden, May 29, 1974, 7407119

Int. Cl.² F26B *13/20*

U.S. Cl. 34—156 **5 Claims**



1. An apparatus for the treatment of web or sheet material carried by means of air to advance the material in a fixed stable floating position without flutter in a conveying path through one or more decks of a treating plant to dry a double-coated material web, consisting of air supply means comprising a plurality of treatment blow boxes and fixing-chamber blow boxes distributed along the conveying path of the web and provided with apertures for outflow of the air against the material, and air exhaust means comprising a plurality of tap apertures provided in or adjacent the blow boxes, characterized in that the web path on each deck of the treating plant is between two blow box series respectively parallel to said path, the series being built up of a combination of a number of treatment blow boxes having a plurality of apertures for the air distributed over the plane of the blow box for blowing air perpendicularly against the web path, with an equal number of blow boxes designated as fixing chambers having apertures for air ejection in parallel with the material web path to fix the material, said series being disposed so that each fixing chamber blow box on one side of the web path faces a treatment blow box on the opposite side of the material web path, and each treatment blow box on the one side of the web path faces a fixing chamber mounted on the opposite side of the web path, the treatment boxes alternating with the fixing chambers in each of said blow box series.

3,982,329

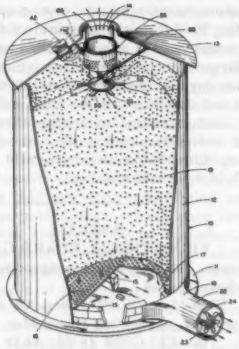
METHOD AND APPARATUS FOR DRYING GRAIN

Harold F. Dougherty, R.R. No. 2, Burchard, Nebr. 68323

Continuation of Ser. No. 363,512, May 24, 1973, abandoned, and a continuation-in-part of Ser. No. 328,042, Jan. 30, 1973, abandoned. This application Aug. 26, 1974, Ser. No. 500,748

Int. Cl.² F26B *3/06*

U.S. Cl. 34—22 **17 Claims**



1. In an apparatus for drying grain in a bin having ambient air thereabout and of the type used on or in the vicinity of the farm where the grain is grown and having openings at the top and at the bottom of the bin with the grain being held static in the bin in a location between the openings, the top opening being exposed to ambient air pressure, the improvement comprising:

blower means having an intake communicating with the bottom of said openings to apply a subatmospheric pressure to said one opening, thus introducing air into the top opening substantially at ambient pressure, said blower means discharging into said ambient air;

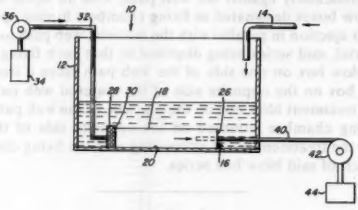
means communicating with said top opening and said ambient air to heat the ambient air entering the top opening before said air reaches the top layer of the grain in the bin;

whereby an air flow of heated air obtained from said ambient air is created downwardly through the entire depth of said grain.

3,982,330
METHOD AND APPARATUS FOR SIMULATING IN A MODEL THE DISBURSEMENT OF GAS AND DUST IN A MINE

Robert D. Saltsman, and Robert D. Harris, both of Delmont, Pa., assignors to Bituminous Coal Research, Inc., Monroeville, Pa.

Filed Aug. 6, 1975, Ser. No. 602,391
Int. Cl.² G09B *25/02*
U.S. Cl. 35—13 **15 Claims**

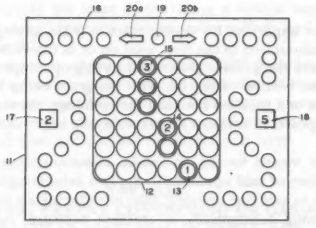


1. Apparatus for simulating in a model the emission of gas and dust during a mining operation comprising,
a tank,
first conduit means for conducting fluid into said tank,
a housing positioned in said tank,
said housing having a pair of sidewalls and top and bottom walls connected thereto with a sealed end portion and an open end portion,
a foraminous member secured to said open end portion for directing fluid from the tank into said housing,
indicia means passing at a controlled rate of flow through said foraminous member into mixture with said fluid in said housing for visually indicating the simulated emission of gas and dust from a mine face, and
second conduit means extending through said housing sealed end portion and positioned adjacent one of said housing sidewalls for conveying said indicia means and said fluid from said housing.

3,982,331
EDUCATIONAL BOARD GAME

Arieh Solomon, Tel-Aviv, Israel, assignor to OR-DA Industries Ltd., Rehovot, Israel

Filed Mar. 20, 1975, Ser. No. 560,543
Claims priority, application Israel, Mar. 20, 1974, 44453
Int. Cl.² G09B *19/02*; **A63F** *3/00*
U.S. Cl. 35—31 D **7 Claims**

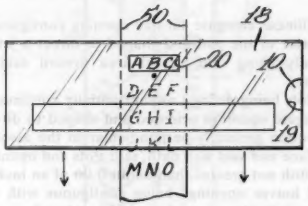


1. An educational board game comprising:
a. a set of tokens, each of which consists of n visually similar units where $n = 1, 2, \ldots$, each unit having board engaging means thereon, multiple units tokens for which $n>1$ being connected together along a longitudinal axis with their board engaging means facing in the same direction and uniformly spaced apart;
b. a board having a plurality of spaced unit engaging means whose pitch is the same as the pitch of the board engaging means of the multiple unit tokens;
c. the engaging means of the tokens and board being cooperable for mounting selected tokens to the board;
d. said unit engaging means defining only a single path with at least one discontinuity at an intermediate location for preventing certain of the tokens from being mounted on the board with all of their board engaging means engaged with unit engaging means adjacent the discontinuity; and
e. manually manipulatable means bearing numbers corresponding to n for making a chance selection of one of the numbers thereby designating a token having the selected number of units for mounting on the board.

3,982,332
SPEED READING AID AND METHOD

Walter Szymczak, 5642 S. Kolmar Ave., Chicago, Ill. 60629

Continuation-in-part of Ser. No. 466,940, May 3, 1974, abandoned. This application Feb. 6, 1975, Ser. No. 547,760
Int. Cl.² G09B *17/02*
U.S. Cl. 35—35 B **3 Claims**



1. A hand held speed reading aid for reading columns of characters of various widths comprising a plurality of opaque cards each having a first viewing slot therein for viewing the entire width of one of said columns, the slots in said cards being of different horizontal widths corresponding to various widths of said columns, said cards being arranged in a stacked, superimposed relationship, the viewing slots in said cards being located such that the cards may be manipulated to isolate the slot of one of said cards for viewing, and means for holding said cards in said stacked relationship and accommodating said manipulation thereof, said means comprising a flat transparent pouch open at one end thereof.

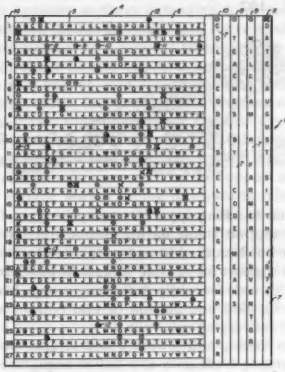
3,982,333
COLORCODE SPELLER

William Robert Farmer, 215 Campbell St., New Westminister, British Columbia, Canada (V3M-5K8)

Filed Oct. 2, 1974, Ser. No. 511,454
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976
Int. Cl.² G09B *11/00*
U.S. Cl. 35—36 **7 Claims**

1. A color coded speller comprising:
a surface;
a plurality of horizontally disposed lines of alphabet letters on said surface;
an equal plurality of horizontally disposed code marking lanes on said surface, each code marking lane disposed directly above a line of alphabet letters;
said horizontal code marking lanes adapted to removably receive code marks;
a plurality of vertically disposed word and sentence lanes on said surface adapted to removably receive alphabet letters whereby a teacher may place a code mark above a

selected letter in some or all of said lines and a pupil may copy said selected letters in one of said vertically disposed



lanes to spell words and sentences which were preselected by the teacher.

3,982,334

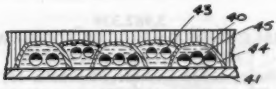
COMPARTMENTALIZED MICROMAGNET DISPLAY DEVICE

Clarence R. Tate, Fairfield, Ill., assignor to Thalatta, Inc., Fairfield, Ill.

Division of Ser. No. 23,424, March 27, 1970, Pat. No. 3,938,263, which is a continuation-in-part of Ser. No. 756,711, Aug. 6, 1968, abandoned, which is a continuation-in-part of Ser. No. 553,086, May 26, 1966, abandoned. This application June 24, 1975, Ser. No. 589,893

Int. Cl.² B43L *1/00*; G01D *15/06*

U.S. Cl. 35—66 **4 Claims**



1. In a device adapted to provide a visual display when an exterior magnetic force is applied thereto, said device comprising a plurality of rotatable, multi-colored, non-magnetically interactive, permanently magnetized micromagnets disposed in a cavity within a body having a transparent surface; the improvement that comprises the presence of a plurality of relatively small fluid-containing compartments, in which said micromagnets are contained, within said cavity; said device being a sheet containing the micromagnets in relatively thin cavity between the front and rear surfaces of the sheet; with the proviso that the micromagnets in the sheet are sealed into cells or compartments by coating areas of rotatable micromagnets into cells or compartments by coating areas of rotatable micromagnets with a hardenable film-former so as to form a sheet having rotatable micromagnet inclusions in the sheet.

3,982,335

SHOE UPPERS

Victor Ralph Cunningham, Hutton, and David Leonard Boutle, Maldon, both of England, assignors to Porvair Limited, England

Continuation of Ser. No. 819,656, April 28, 1969, abandoned, which is a continuation-in-part of Ser. No. 620,792, March 6, 1967, abandoned, and Ser. No. 697,154, Jan. 11, 1968, abandoned. This application Oct. 12, 1971, Ser. No. 188,572

Claims priority, application United Kingdom, Jan. 11, 1967, 1608/67; Jan. 11, 1967, 1609/67; Mar. 7, 1966, 9974/66

The portion of the term of this patent subsequent to Apr. 24, 1990, has been disclaimed.

Int. Cl.² B32B *3/00*, *5/14*

U.S. Cl. 36—45 **8 Claims**

1. In a lasted shoe upper having in place of the upper leather thereof a water vapour permeable artificial leather sheet material which consists essentially of a strength-giving base layer forming the major part of the thickness of the material and a microporous non-cellular surface layer of elastomeric polyurethane on said base layer, the improvement wherein said strength-giving base layer consists essentially of microporous water-vapour permeable elastomeric polyurethane, the polyurethane of said microporous surface layer being the same as the polyurethane of said microporous base layer, said surface layer having a thickness of more than 0.005 inch and less than 0.05 inch and being more open and less dense, less tough, and more permeable to water vapour than said base layer, said layers being free of fibrous reinforcement and thereby having the elastomeric characteristics of said elastomeric polyurethane on stretching, and said shoe upper being resistant to formation of 'orange peel' surface effects when stretched in the lasting operation employed in its manufacture, said strength-giving base layer free from fibrous reinforcement being prouduced by a method which comprises forming on a support a continuous layer of a solution of elastomeric polyurethane working material in a solvent therefor, coagulating said layer, having said composition, by means of coagulating liquid, removing substantially all the solvent of said layer by washing with coagulating liquid, the coagulating liquid being a nonsolvent for said elastomeric working material and being at least partially miscible with the solvent for the elastomeric working material, and drying the resulting water vapor permeable flexible sheet material, said method including the step of stripping the coagulated layer from the support.

3,982,336

ATHLETIC SHOE WITH A DETACHABLE SOLE

Richard E. Herro, Rte. 5, Mound View Estates, Joliet, Ill. 60436

Filed Jan. 21, 1976, Ser. No. 650,893

Int. Cl.² A43C *15/00*; A43B *13/00*

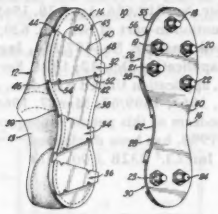
U.S. Cl. 36—62 **7 Claims**

1. A shoe having a sole and opposed elongated side edges comprising:

projection means extending between said side edges on the sole of the shoe, said projection means being tapered such that said projection means have opposed, tapered edges converging near one side edge of said shoe and;

a detachable sole with tapered groove means designed to

mate with said projection means on said sole such that said detachable sole is released from said sole of said shoe



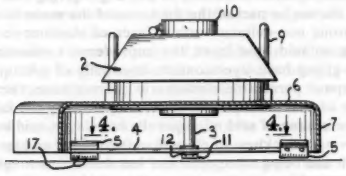
only when a force is applied across said shoe from said one side edge to the other side edge.

3,982,337

SNOW MOVING APPARATUS

Eugene L. Garriott, 614 E. Gordon, Marshall, Mo. 64340

Filed Sept. 19, 1975, Ser. No. 559,896
Int. Cl.² E01H 5/09, 5/02
U.S. Cl. 37—43 L **1 Claim**



1. A snow moving apparatus comprising:

a. a housing having a top wal and a side wall depending therefrom, said side wall having a discharge opening therein;

b. means mounted on said housing to permit movement thereof along a selected path;

c. a substantially vertical drive shaft depending from said top wall of said housing and means operatively connected thereto for selectively rotating same;

d. an elongated support bar mounted on said drive shaft and extending normal thereto for rotation on a substantially horizontal plane, said support bar having opposite end portions; and

e. a pair of unitary detachable plastic concavely curved impeller members each mounted on and along the edge of a respective opposite end portion of said support bar and generally coextensive therewith and having a lower flexible portion curved downwardly and forwardly from the support bar and of decreasing thickness terminating in a thin lower edge, said lower flexible portion having a plurality of longitudinally spaced slots extending upwardly therein from said lower edge to define a plurality of flexible teeth,

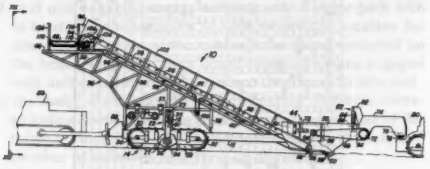
f. said impeller members each having an upper portion curved upwardly and forwardly and of greater thickness than the depending portion of said lower flexible portion from said support bar and terminating in an end substantially parallel to said support bar, said curved portions cooperating to move snow laterally outwardly through the discharge opening in said housing side wall upon rotation of said drive shaft.

3,982,338

MATERIAL HANDLING APPARATUS

Perry J. Dick, and Perry J. Dick, Jr., both of Pittsburgh, Pa., assignors to Trumbull Corporation, Pittsburgh, Pa.

Filed Dec. 16, 1974, Ser. No. 532,774
Int. Cl.² E02F 5/00
U.S. Cl. 37—102 **10 Claims**



1. Material handling apparatus comprising,

a mobile support frame having ground traction means,

a scraper bowl secured to and positioned forwardly of said mobile support frame, said scraper bowl having a bottom wall with a downwardly deflected scraper blade secured to the forward end portion of said bottom wall and inwardly converging sidewalls,

means for raising and lowering said scraper bowl to move said scraper blade into and out of engagement with the ground,

an inclined endless conveyor secured to said mobile support frame and positioned thereon parallel to the direction of travel of said scraper bowl,

said inclined endless conveyor having a lower material receiving end portion positioned between said inwardly converging sidewalls and an upper material discharging end portion positioned rearwardly of said scraper bowl,

material moving means secured to said sidewalls for continuously moving the material loaded into said scraper bowl onto said material receiving end portion of said inclined endless conveyor and thereby convey the material upwardly and rearwardly to said material receiving end portion,

a transverse endless conveyor secured to said mobile support frame and intermediately positioned beneath said material discharging end portion to convey the material laterally in a selected direction, and

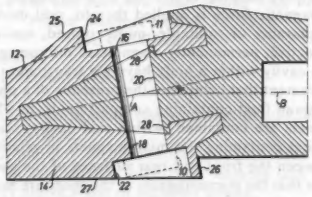
drive means for rotating said inclined endless conveyor and said transverse endless conveyor to convey the material from said scraper bowl by said inclined endless conveyor to said transverse endless conveyor.

3,982,339

REVERSIBLE SLIDE-ON DIGGER TOOTH WITH EASY REMOVAL ARRANGEMENT

Lennart Nilsson, 12232 Enskede, Stockholm 45, Sweden

Filed Feb. 24, 1975, Ser. No. 552,564
Claims priority, application Norway, Jan. 20, 1975, 160/75
Int. Cl.² E02F 9/28
U.S. Cl. 37—141 T **2 Claims**



1. A tooth for a loading or excavating bucket, said tooth having a slide-on member and a support member for supporting said slide-on member; said slide-on member having a first wear surface and a second surface opposite thereto and form-

ing with said wear surface a wedge-like front portion of said slide-on member, said slide-on member having further a rear portion having between said first and second surfaces two legs separated by a recess; said support member having a front portion engaging with said recess and two shoulders engaging with the ends, respectively, of said legs, and a rear portion having two opposite surfaces extending from said shoulders, said rear portion further having means for reversibly securing said support member to a forward terminal edge portion of a bucket with either of said opposite surfaces turned upwards relative to said bucket, said securing means comprising two legs defining a recess for receiving said terminal edge portion; said recess of said slide-on member and said front portion of said support member being symmetrical with respect to a first centre plane between said slide-on member legs to allow the slide-on member to be supported by the support member with said wear surface always facing downwards relative to said bucket although said support member has been reversed on said edge portion, depending upon the relative location of said opposite surfaces of said rear portion on said forward terminal edge portion, said first plane further extending at an angle to and intersecting a second centre plane between said support member legs such that the inclination of said wear surface to said second plane when on one side of said first plane, differs from the inclination of the wear surface, when on the other side of the first plane; a bolt extending through said legs of said slide-on member and said front portion of said support member and means for facilitating replacement of said slide-on member comprising a countersink in said wear surface, said bolt having an enlarged end member located in said countersink, the bottom of said countersink being substantially in the plane of either of said opposite surfaces of said rear portion of said support member at the corresponding shoulder when either surface is disposed adjacent the wear surface, whereby when the wear surface has been worn down to the bottom of said countersink, the enlarged end of said bolt will also be substantially worn away, enabling easy removal of said bolt and replacement of said slide-on member.

3,982,340

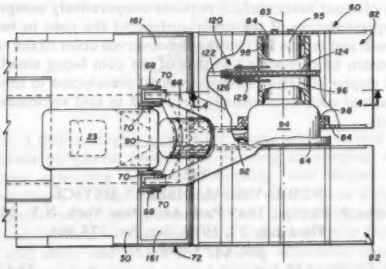
TWO WHEEL EXCAVATING AND LOADING SYSTEM

Charles R. Satterwhite, Dallas, Tex., assignor to Unit Rig and Equipment Co., Tulsa, Okla.

Continuation-in-part of Ser. No. 435,296, Jan. 21, 1974, Pat. No. 3,896,571. This application July 17, 1975, Ser. No. 596,677

Int. Cl.² E02F *3/24*

U.S. Cl. 37—190 **17 Claims**



1. An excavating and loading system comprising:

an excavating wheel assembly comprising two rigid excavating wheels, said excavating wheel assembly having a width at least equal to the widest portion of the remainder of the system;

each of said excavating wheels including a plurality of digging buckets located immediately adjacent one another to define the entire circumference of the excavating wheel, each bucket having a cutting edge which extends to a stationary wall, and a wall mounted for pivotal movement from a material receiving position to a material dumping position;

supporting and housing means extending between the two excavating wheels for supporting the excavating wheel assembly;

means supporting the two excavating wheels cantilever on the supporting and housing means for rotation with respect thereto;

each of said digging buckets extending continuously between a side wall thereof located immediately adjacent to the supporting and housing means and a side wall thereof defining one end of the excavating wheel assembly;

drive means for rotating the excavating wheels so that the digging buckets follow a circular path;

means located within the margins of the excavating wheel assembly and responsive to rotation of the excavating wheels for positively pivoting the movable wall of each digging bucket of the excavating wheels to the material receiving position when the bucket is in the lower and forward portion of the path and for positively pivoting the movable wall to the material dumping position when the bucket is in the upper and rearward portion of the path;

a vehicle for supporting and manipulating the excavating wheel supporting means and thereby positioning the excavating wheel assembly in engagement with material to be excavated; and

conveyor means mounted on the vehicle behind the excavating wheel assembly for movement around a course including a relatively low portion positioned to receive material from the digging buckets of the excavating wheels upon the positioning of the movable walls of the buckets in the material dumping position and a relatively high material delivery portion located rearwardly on the vehicle from the low portion.

3,982,341

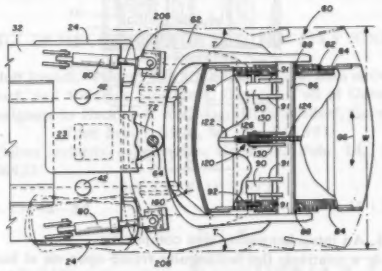
TRANSVERSE OSCILLATION FOR EXCAVATING AND LOADING SYSTEM

Charles R. Satterwhite, Dallas, Tex., assignor to Unit Rig and Equipment Co., Tulsa, Okla.

Continuation-in-part of Ser. No. 435,296, Jan. 21, 1974, Pat. No. 3,896,571. This application July 17, 1975, Ser. No. 596,680

Int. Cl.² E02F *3/24*

U.S. Cl. 37—190 **10 Claims**



1. An excavating and loading system comprising in combination:

a vehicle, a main frame and a subframe on the vehicle;

means supporting the main frame of the vehicle for movement over a surface;

an excavating wheel means including a plurality of digging buckets located immediately adjacent one another to define the entire circumference of the excavating wheel and each having a cutting edge which extends to a stationary wall and a wall mounted for pivotal movement from a material receiving position to a material dumping position, said excavating wheel means being narrower than the widest portion of the vehicle;

a supporting and housing means rotatably supporting the excavating wheel means from the subframe whereby the excavating wheel means is positioned in the front of the main frame of the vehicle;

means for selectively varying the relative positioning of the subframe and the main frame whereby the excavating wheel means can be selectively raised or lowered to excavate at various depths;

drive means for rotating the excavating wheel means so that the digging buckets follow a circular path;

means located within the margins of the excavating wheel means and responsive to rotation thereof for positively positioning the movable wall in the material dumping position when the bucket is in the upper and rearward portion of the path;

conveyor means mounted on the vehicle entirely behind the excavating wheel assembly for movement around a course including a relatively low portion positioned to receive material from the digging buckets of the excavating wheel means and a material dumping position relatively high and located rearwardly on the vehicle;

means in said supporting and housing means for oscillating said excavating wheel means transverse to the direction of travel of the apparatus for forming an excavation wider than the widest portion of the vehicle whereby the vehicle can travel along the excavation;

said supporting and housing means comprising a yoke with the excavating wheel means mounted on said yoke for rotation about a horizontal axis;

said yoke being connected to said subframe to rotate about a vertically extending axis; and

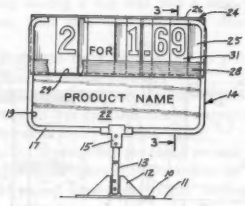
actuator means connected between said subframe and said yoke for selectively oscillating said yoke about said vertical axis.

3,982,342

INTERCHANGEABLE PRICE INDICATING SIGN

Charles T. Moore, Minneapolis, Minn., assignor to Dayton-Hudson Corporation, Minneapolis, Minn.

Filed July 21, 1975, Ser. No. 597,361
Int. Cl.² G09F *3/20*
U.S. Cl. 40—5 **10 Claims**



1. An interchangeable sign comprising:

A. a relatively flat rectangular frame open on at least one side, having narrow end and bottom walls and having a narrow retaining lip surrounding the opening,

B. means for supporting said frame,

C. a slot opening in the top of said frame extending the length thereof,

D. at least one product information-bearing card in said frame, of length greater than said opening, resting upon the inside bottom frame wall and retained by the portion of the lip adjacent the bottom and end walls,

E. at least one price indicia holder in said frame, of length greater than and width substantially lesser than said side opening,

1. said indicia holder having a flat semi-rigid sheet material body and an outwardly extending flange along its top edge, said flange engaging the top edge of the frame to support the holder in said slot opening,

2. a relatively narrow indicia holding pocket extending along the bottom edge of said holder, said pocket including a flat rectangular front wall parallel to and closely spaced from said flat body and contiguous with the bottom edge thereof,

3. the bottom edge of said holder overlying said card and the ends of said indicia holder being retained by the lip adjacent the end walls, and

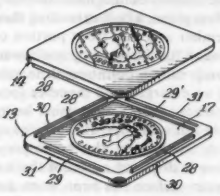
F. a plurality of interchangeable flat rectangular price indicia elements in said holder, the bottom edges of said indicia elements being held in said pocket and the top edges of said elements being retained by the lip adjacent to the top of the frame.

3,982,343

SIMULATED ARTICLE DISPLAY STRUCTURE

Josef F. Klingler, 1335 Gregory, Wilmette, Ill. 60091

Filed June 18, 1975, Ser. No. 588,069
Int. Cl.² G09F *3/02*
U.S. Cl. 40—27.5 **17 Claims**



1. A simulated coin display structure comprising: a first enclosure element having a transparent portion provided with an inner surface portion defining a representation of the front configuration of a coin to be displayed through said transparent portion of the first enclosure element; a complementary second enclosure element retained in association with said first enclosure element and having a transparent portion aligned with said first element transparent portion and provided with an inner surface portion defining a representation of the rear configuration of the coin to be displayed through said transparent portion of the second enclosure element, said surface configuration defined by said first and second enclosure element inner surface portions cooperatively comprising a representation of the outer surface of the coin to be displayed; and means for causing the observed color of the representation to correspond to that of the coin being simulated, said display structure having a weight preselected to simulate an actual such coin visually simulated in said enclosure elements.

3,982,344

AUDIO-VISUAL DISPLAY DEVICE

Calman P. Phillips, 1049 Park Ave., New York, N.Y. 10028

Filed July 27, 1972, Ser. No. 275,486
Int. Cl.² G09F *13/10*
U.S. Cl. 40—106.1 **10 Claims**

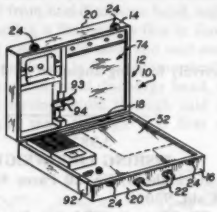
1. A display device comprising:

a. a carrying case having two complementary case halves that are pivotally connected to one another for relative movement to and from a closed condition in which said halves are in close confronting relation and from and to an open condition in which said halves are substantially coplanar;

b. a light transmitting member in one of said case halves, means underlying said light transmitting member for illuminating same;

c. a transparency magazine including a backing member having a pair of spaced apart edges and a plurality of transparencies superposed thereon, means for hingedly mounting said transparencies to said backing member along corresponding substantially coplanar edges which includes one of said edges of said backing member;

d. complementary connecting means on said backing member adjacent the other of said edges of said backing member and operatively connected to the other half of said case for releasable securing said backing member to said



other half of said case with said hinged connecting means adjacent said light transmitting member when said case is in said open condition; and

e. means for permitting pivotal movement of said backing member toward and away from said other half of said case, whereby transparencies overlying said backing member may be swung about said hinged connecting means into a display position overlying said light transmitting member and into a storage position underlying said backing member.

3,982,345

DISPLAY DEVICE WITH FLEXIBLE FACE

Kelly R. Coleman, 2367 Anna Ave., Clearwater, Fla. 33515

Continuation of Ser. No. 317,512, Dec. 22, 1972, abandoned. This application May 23, 1975, Ser. No. 580,517

Int. Cl.² G09F *13/04*

U.S. Cl. 40—132 R **1 Claim**

1. A display device comprising: frame means having a continuous peripheral portion surrounding an opening, display means extending across said opening, said display means including a flexible translucent sheet of synthetic polymeric material having indicia thereon, means for applying adjustable tensioning force to said sheet in a first direction in the plane of said sheet and means for applying adjustable tensioning force to said sheet in a second direction in the plane of said sheet and perpendicular to said first direction in order to impart rigidity thereto, each of said means including connecting means supported by said frame means and connected to a pair of oppositely disposed edges of said sheet, and a lighting assembly supported within said frame means and located relative to said sheet so as to transmit light therethrough, including four shield means each of which is adjustably mounted on said frame means for swinging movement between a first position in which it covers one of the connecting means associated with an edge of said sheet and a second position in which the respective connecting means is uncovered.

3,982,346

CARTRIDGE OR CARTRIDGE CASE EJECTORS FOR REVOLVER CYLINDERS

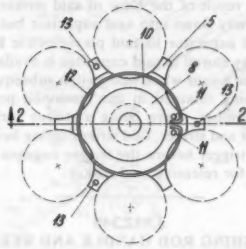
Andre Pilorget, 37 Chemin de Bellevue, Chatou (Yvelines), France

Filed Feb. 27, 1975, Ser. No. 553,788

Claims priority, application France, Mar. 7, 1974, 74.07721

Int. Cl.² F41C *15/00*

U.S. Cl. 42—68 **3 Claims**



1. An ejector for ejecting cartridge cases from the cylinder of a revolver, comprising a pin for which the center of the revolver cylinder serves as a guide, a disc secured to the pin, there being a plurality of outwardly opening notches spaced about the periphery of the disc, a flexible annular element whose outer edges are smoothed off and which projects slightly from the bottom of each notch in said disc, and means securing said annular element to said disc against removal from said disc in a direction lengthwise of said pin but permitting retraction of said annular element into said notches, whereby when rimmed cartridges are introduced into chambers of the revolver cylinder the annular element retracts into said notches and slides along the cartridges, and when grooved cartridges are introduced into the cylinder chambers the annular element retracts into said notches as the cartridges pass but projects again and penetrates into the cartridge grooves as soon as the cartridge grooves are situated in front of the annular element.

3,982,347

TRIGGER MECHANISM FOR ELECTRICALLY IGNITED WEAPONS

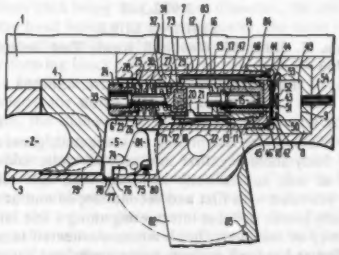
Rudolf Brandl, Weiden; Tilo Möller; Karl Saile, both of Oberndorf, and Heinrich Streckfuss, Dettingen, all of Germany, assignors to Heckler & Koch GmbH, Oberndorf, Germany

Filed Feb. 7, 1975, Ser. No. 548,151

Claims priority, application Germany, Feb. 14, 1974, 2406933

Int. Cl.² F41C *19/12*

U.S. Cl. 42—84 **19 Claims**



1. A trigger mechanism for electrically ignited weapons having a source of electric energy and electrical ignition

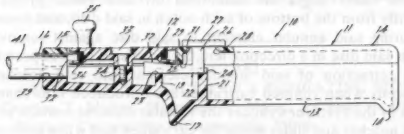
means, leads connecting the source of energy with the electrical ignition means for a propelling charge contained in the weapon, a trigger, and a normally open switch which is interposed in one of said leads and which can be closed for igniting said ignition means by pulling the trigger, in which said source of energy comprises a piezoelectric body and a capacitor connected in parallel with said piezoelectric body, in which said trigger is coupled with a striker which is tripped from a tensioned position when said trigger is pulled and released for striking said piezoelectric body before said switch closes, and in which said leads are connected with said capacitor and a diode is arranged between said piezoelectric body and said capacitor, the polarity thereof being such that the charge produced as a result of the blow of said striker against said piezoelectric body flows into said capacitor but cannot flow back from said capacitor to said piezoelectric body and the electrical energy stored in said capacitor is available for igniting said ignition means when said switch subsequently closes, said striker being retained in the tensioned position by an engagement member, there being a striker spring arranged between trigger and striker, said striker spring being tensioned by pulling the trigger before the trigger engages said engagement member for releasing said striker.

3,982,348

FISHING ROD HANDLE AND REEL

Maynard Wallace, 38172 Seaway Drive, Mount Clemens, Mich. 48043

Filed July 14, 1975, Ser. No. 595,358
Int. Cl.² A01K *87/00, 89/02*
U.S. Cl. 43—20 **7 Claims**



1. A combined fishing rod handle and reel comprising an elongated fishing rod handle, the rear portion of the handle being enclosed, the forward portion being upwardly open, a reel with a line groove rotatably mounted in the upwardly open forward portion of the handle and having upwardly and downwardly facing surfaces facing away from the line groove, line guide means on the handle forwardly of the reel, a releasable stop slidably mounted on the handle rearwardly of the reel, and complementary inclined surfaces on said stop and reel, the inclined surface on said reel being part of said downwardly facing surface, the stop having a thumb-engageable portion disposed rearwardly of the reel and being movable between a releasing position in which said complementary inclined surfaces are separated and a braking position in which the complementary inclined surfaces are engaged.

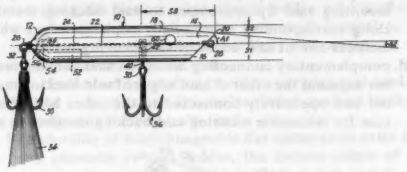
3,982,349

FISHING LURE

William H. Hills, 25 Woodhull Road, East Setauket, N.Y. 11733

Filed Mar. 29, 1974, Ser. No. 456,063
Int. Cl.² A01K *85/00*
U.S. Cl. 43—42.48 **16 Claims**

1. A fishing lure comprising an elongated, generally cylindrical body including first and second ends, said first end being at least substantially hemispherical, said second end being provided with first and second sloped and at least substantially planer surfaces intersecting along a line forming one extremity of said body, hook means connected to said body, said first and second surfaces being upper and lower surfaces respectively, said upper surface being at a shallower angle than said lower surface, and line attachment means on said body and located at said lower surface, said body having a longitudinal axis of symmetry and said first and second surfaces respectively forming angles of 6°–12° and 40°–50° with said axis.

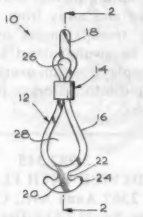


3,982,350

FISHING LINE WEIGHT

Donald W. Heckathorn, No. 20 Paseo Margarita, Camarillo Springs, Calif. 93010

Filed Nov. 6, 1974, Ser. No. 521,239
Int. Cl.² A01K *95/00*
U.S. Cl. 43—43.1 **5 Claims**



1. A device for attaching a stone or the like to a fishing line, said device comprising:

a flexible elastic strap having a certain total length when unstressed;

adjustable means attached to said strap to form at least a portion of said strap length into a substantially closed curve for encircling, engaging and conforming to an irregular peripheral surface of a stone;

attaching means connected to said strap for attaching said strap to a fishing line, said attaching means including a post projecting from said strap substantially perpendicular to the length thereof; and

a flange means formed on said post.

3,982,351

CAB MOUNTED REMOTE CONTROL APPARATUS

David W. Waldron, Valdosta, Ga., assignor to Lowndes Engineering Co., Inc., Valdosta, Ga.

Continuation of Ser. No. 216,395, Jan. 10, 1972, abandoned, which is a continuation-in-part of Ser. No. 20,364, March 17, 1970, Pat. No. 3,633,825. This application Feb. 15, 1974, Ser. No. 442,866
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976
Int. Cl.² A01M *19/00*
U.S. Cl. 43—129 **10 Claims**

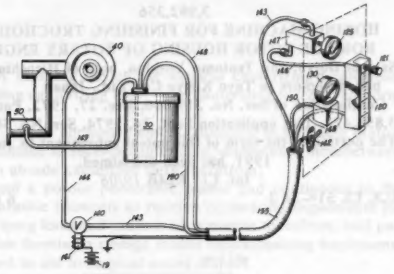
1. Apparatus for use in controlling a fog generator used in applying insecticides from a vehicle comprising in combination:

a. discharge head for use in developing a fog mixture of air and insecticide;

b. means for supplying insecticide under pressure to said discharge head including a supply tank;

c. means for supplying air pressure means to said discharge head; and,

d. control means operatively associated with said insecticide supply means for controlling the discharge of said insecticide under pressure, said control means including a flow meter having an adjustable flow rate control valve and thermometer means for sensing the temperature of insecticide flowing through said flow rate control valve and said flow meter, said flow meter and said thermometer means and said flow rate control valve being located in the vehicle operator's position and remote from said supply tank and from said discharge head, supply lines for said liquid including a first supply line in flow communication between said supply tank and said control means and a second supply line in flow communication between said control means and said discharge head, and transfer means for transferring liquid through said supply lines from said supply tank through said first supply line,



through said flow meter, through said second supply line to said discharge head, said flow meter and said adjustable flow rate control valve being connected in series between said supply tank and said discharge head whereby flow of insecticide to said discharge head may be monitored and controlled in said vehicle operator's position in accord with temperature variations occuring in said insecticide, an electromagnetic valve in one of said supply lines operable between an insecticide off position and an insecticide discharge position, and switch means in said vehicle operator's position for controlling said electromagnetic valve whereby a vehicle operator may not only control the associated vehicle but may also completely control discharge of said insecticide, said flow meter and said thermometer being disposed adjacent to each other for simultaneous observation by the operator, said valve being disposed for manipulation thereof by the operator as he observes said flow meter.

3,982,352

KNOCK DOWN CONVERTIBLE TOY

J. Howard Branson, 127 S. Atlantic Ave., Haddonfield, N.J. 08033

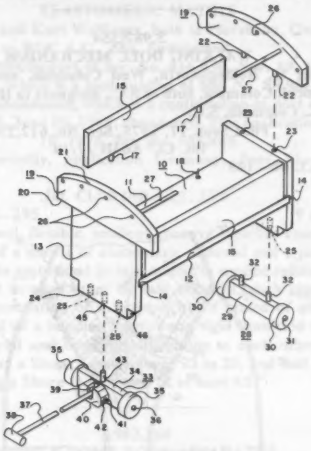
Filed Apr. 7, 1975, Ser. No. 565,411
Int. Cl.² A63H *33/06*
U.S. Cl. 46—17 **3 Claims**

1. A knockdown toy capable of being converted into a plurality of different toy configurations of beds, sofas and cradles comprising:

a basic frame formed of a flat horizontally disposed rectangular intermediate panel having one pair of sides longer than the other and complementary opposed end panels secured at approximately their mid points to the short sides thereof intermediate the end panels and perpendicular thereto;

two side panels of length approximating the long sides of the intermediate panel and of height approximating the distance the end panels project above the intermediate panel;

means for releasably securing each side panel to the long sides of the intermediate panel;



two end rocker panels each including an arcuate edge; and

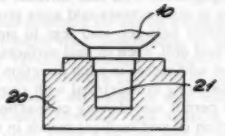
means for releasably securing each rocker panel to either the upper or lower extremity of each end panel whereby selective assembly of the different components will create different toys.

3,982,353

DOLL HEAD MOUNTING JOINT

Godtfred Kirk Christiansen, Billund, Denmark, assignor to Interlego A.G., Switzerland

Filed Jan. 31, 1975, Ser. No. 546,033
Int. Cl.² A63H *33/06*
U.S. Cl. 46—22 **1 Claim**



1. A mounting joint for quick detachably connecting a doll head to a supporting block comprising

a doll head having at least three means thereon for connecting elements thereto, one of said means comprising a cylindrical body connecting portion projecting from said head, said portion including three axially spaced coaxial sections each being of a different diameter, the one nearest the head being of greatest diameter, the most remote from the head being of the least diameter;

a body forming block adapted to receive said portion, said block having a central cavity and four studs projecting symmetrically about said cavity above the plane of its mouth, the diameter of said section most remote from said head being equal to that of said cavity, the diameter of said intermediate section being slightly greater than a circle tangent to the vertical surfaces of the studs at a point on said vertical surface of said stud nearest the cavity, the intermediate portion being thus frictionally engageable with the vertical surfaces at the said points of tangency, and the portion nearest the head constituting the neck of said doll head, being too large to be engaged within said vertical surfaces and abutting the tops of said

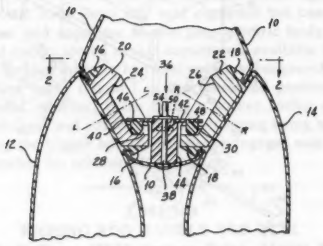
four studs whereby said neck portion is visible above said studs.

3,982,354

WALKING DOLL MECHANISM

Charles M. Hollingsworth, West Columbia, and Witold W. Kosicki, Columbia, both of S.C., assignors to Horsman Dolls Inc., Columbia, S.C.

Filed Sept. 11, 1975, Ser. No. 612,238
Int. Cl.² A63H *11/14*
U.S. Cl. 46—149 **14 Claims**



1. Walking simulating apparatus for a doll including in combination, a torso having a longitudinal axis, a pair of leg mounting openings in said torso, a pair of legs, means mounting said legs respectively in said mounting openings, for movement around respective axes, each of said mounting means forming a surface extending around the axis of rotation of its associated leg, a recess in each of said surfaces, a pair of arms, respective detent means on said arms, and means mounting said arms for pivotal movement around an axis extending between said leg mounting means and with said detent means in cooperative relationship with said surfaces, said arm mounting means comprising means for resiliently urging said detent means into engagement with said surfaces so that when said detents engage in said recesses said arms provide a releasable driving connection between said legs to simulate a walking movement of said doll, each of said surfaces for an appreciable extent from said recess in each direction around the associated said axis being symmetrical with respect to said associated axis to permit said driving connection to be released against the action of said resilient means in each direction of relative movement of said detent means with respect to the associated surfaces without damage to the apparatus.

3,982,355

ADJUSTABLE BLIND STRUCTURE

Anthony C. Piercey, 40 West Way, Heston, Hounslow, Middlesex, England

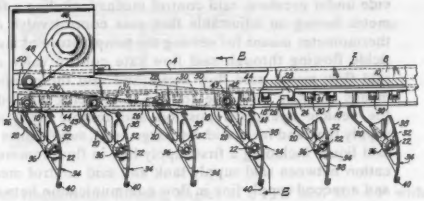
Filed Feb. 20, 1976, Ser. No. 659,914
Claims priority, application United Kingdom, Mar. 19, 1975, 11442/75
Int. Cl.² E05F *17/00*; E06B *7/086*
U.S. Cl. 49—74 **7 Claims**

1. In an adjustable slat blind mechanism having elongated supports extending along opposite sides of an opening and blind slats extending therebetween and pivoted thereto, the improvement comprising:

each of said supports defining an outwardly open channel extending therealong, the inner side faces of said channel having inwardly facing detent portions;

a plurality of slat brackets in said channel, each having latching portions engaging the said detent portions, each slat bracket having at least one supporting arm extending outwardly away from said channel and having a slat holder pivoted thereto; and

interengaging means on said slat brackets holding said brackets against relative movement along said channel



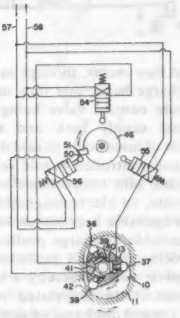
whereby said supporting arms are held in predetermined spaced relation.

3,982,356

HONING MACHINE FOR FINISHING TROCHOIDAL BORE OF ROTOR HOUSING OF ROTARY ENGINE

Satoshi Dojyo, and Tsutomu Yoshino, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Japan

Continuation of Ser. No. 319,000, Dec. 27, 1972, Pat. No. 3,851,422. This application Sept. 24, 1974, Ser. No. 508,901
The portion of the term of this patent subsequent to June 11, 1991, has been disclaimed.
Int. Cl.² E24B *19/08*
U.S. Cl. 51—34 J **6 Claims**



1. A honing machine for finishing a trochoidal bore of a workpiece by honing the inner wall surface thereof having an opening portion, comprising:

a. a honing head provided on its periphery with a honing stone which is biased outwardly into sliding contact with the inner wall surface of the workpiece for honing the same when rotatably received within the trochoidal bore,

b. a honing head shaft coaxially secured to said honing head,

c. means for rotating the honing head shaft,

d. a machine table for holding the workpiece in position,

e. means for controlling the position of the honing head and the machine table to draw a preset trochoid curve,

f. detecting means for detecting when the honing stone is on the opening portion,

g. bias-pressure control means for controlling the bias pressure of said honing stone toward said inner wall surface,

h. a pressurized fluid source communicating with said bias pressure control means for supplying thereto a liquid under pressure, and

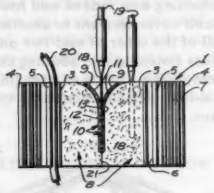
i. honing control means hydraulically connected to said pressurized fluid source and responsive to said detecting means for decreasing the bias pressure of said honing stone toward said inner wall surface when said honing stone is on the opening portion of the inner wall surface.

3,982,357

CLEANING DEVICE FOR CAUTERIZING KNIVES

John D. Eldridge, and William D. De Mayo, both of 1115 E. Elm, Fullerton, Calif. 92631

Filed Apr. 14, 1975, Ser. No. 567,627
Int. Cl.² B24B 3/54; A47L 21/00
U.S. Cl. 51—181 R 15 Claims



1. A cleaning device for surgical cauterizing implements including cauterizing knives and cauterizing forceps, comprising:

a. a pair of abrasive elements disposed in yieldable mutual contact to receive cauterizing implements therebetween to abrade cauterized flesh therefrom;

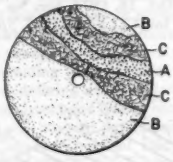
b. and a porous penetrable plastic pad contiguous to the abrasive elements to receive cauterizing implements for wiping loosened cauterized remnants therefrom, said pad also forming a storage means for cauterizing implements and to aid in surgical count thereof.

3,982,358

LAMINATED RESINOID WHEELS, METHOD FOR CONTINUOUSLY PRODUCING SAME AND APPARATUS FOR USE IN THE METHOD

Heijiro Fukuda, No. 123, 3-chome, Umegaoka, Nagaokakyo, Kyoto, Japan (617)

Division of Ser. No. 494,015, Aug. 1, 1974. This application Apr. 23, 1975, Ser. No. 570,980
Claims priority, application Japan, Oct. 9, 1973, 48-113718; Oct. 9, 1973, 48-113720; Oct. 9, 1973, 48-117761[U]; Mar. 18, 1974, 49-31284
Int. Cl.² B24D 7/14, 5/14
U.S. Cl. 51—207 6 Claims



1. In an improved laminated resinoid wheel of the type comprising a core layer, and at least one pair of outer layers, wherein the core layer is made of an abrasive composition containing abrasive grains, and said at least one pair of layers are arranged on the opposite sides of the core layer symmetrically thereof and made of an abrasive composition containing abrasive grains different in size from those of the abrasive composition of the core layer, wherein the improvement comprises:

front and rear surfaces of said wheel being rough-surfaced by a terminal unit of rolling rolls coated with a soft material.

3,982,359

ABRASIVE MEMBER OF BONDED AGGREGATES IN AN ELASTOMERIC MATRIX

Karl Elbel, and Kurt Wolfinger, both of Pforzheim, Germany, assignors to ROC A.G., Zug, Switzerland

Continuation-in-part of Ser. No. 416,830, Nov. 19, 1973, abandoned, which is a continuation of Ser. No. 88,981, Nov. 12, 1970, abandoned, which is a continuation-in-part of Ser. No. 834,885, June 19, 1969, abandoned. This application June 10, 1975, Ser. No. 585,465
Claims priority, application Germany, June 21, 1968, 1752612
Int. Cl.² B24D 3/22, 3/28
U.S. Cl. 51—295 9 Claims

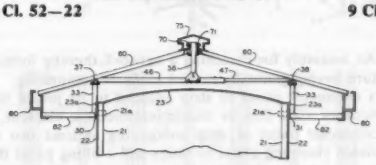
1. A shaped, flexible, resilient abrasive member essentially consisting of a matrix of elastomeric material and a plurality of aggregates embedded in said matrix in spaced relationship and bonded to each other by said material, each aggregate essentially consisting of a multiplicity of grains of abrasive material and of a bonding agent more rigid than said elastomeric material and bonding said grains to each other, said matrix having a Shore A hardness of 75 to 20, and said aggregates having a Shore D hardness of at least 65.

3,982,360

MOBILE HOME ROOF APPARATUS

Ernest L. Newman, Box 139, R.F.D. No. 2, Owego, N.Y. 13827

Continuation of Ser. No. 452,753, March 20, 1974, abandoned. This application Apr. 7, 1975, Ser. No. 565,527
Int. Cl.² E04B 7/00, 7/04
U.S. Cl. 52—22 9 Claims



1. An added roof structure for use on a house trailer having an existing sheet-metal roof, comprising, in combination: a first plurality of vertically-extending support posts spaced apart from each other along a first side of said trailer and fixedly mounted against said side of said trailer; a second plurality of vertically-extending rigid support posts spaced apart from each other along a second side of said trailer and mounted against said second side of said trailer, each of said support posts extending from a level below said existing sheet-metal roof to a level above said existing sheet-metal roof; a first longitudinally-extending strip means fastened to and interconnecting the upper ends of said support posts of said first plurality; a second longitudinally-extending strip means fastened to and interconnecting the upper ends of said support posts of said second plurality; a plurality of rigid laterally-extending support bracket means each extending between and attached to said first and second longitudinally-extending strip means to prevent lateral relative movement between said first and second longitudinally-extending strip means; a third plurality of rigid support posts each affixed to and extending upwardly from a respective one of said laterally-extending support bracket means; third longitudinally-extending strip means affixed to an interconnecting said third plurality of support posts adjacent their upper ends; a first plurality of mutually-interlocking roof sheet means each supported by said third strip means and said first strip means; a second plurality of mutually-interlocking roof sheet means each supported by said third strip means and said second strip means; a first member fixed to and extending from one of said support posts of said third plurality adjacent an end of said trailer downwardly and laterally outwardly beyond one of said support posts of said first plurality adjacent said end of said trailer

and being connected to said one of said support posts of said first plurality; a second member extending laterally across and affixed to said end of said trailer at a level below said existing roof; and a plurality of metal sheets each connected to said first and second members.

3,982,361

MODIFIED STRUCTURE FOR LINING GENERALLY CURVED SURFACES

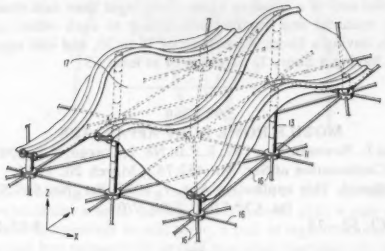
Ernst Deutsch, and Bernhard Reifenscheid, both of Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Germany

Continuation-in-part of Ser. No. 457,214, April 1, 1974, abandoned. This application Dec. 23, 1974, Ser. No. 535,983

Claims priority, application Germany, Dec. 21, 1973, 2363706

Int. Cl.² E04B *7/14, 7/10*

U.S. Cl. 52—80 **22 Claims**



1. An assembly for sheathing a network thereby forming a structure having generally curved surfaces comprising:

a. a connector panel or strip adapted to be joined to the network via a firm or elastic intermediate element, said connector panel or strip comprising at least two associated clamping plates or strips and a filling panel therebetween to regulate the distance between the individual clamping plates or strips, said connector panel or strip holding two bearing profile members of a weather resistant and aging-resistant vulcanized elastomer, and

b. a covering panel attached to at least one of the bearing profile members held by the connector panel or strip, said covering panel being shaped to fit said network and comprising a fabric cover stretched in the manner of a diaphram so that it exhibits a spatial double curvature and is under tensile stress.

3,982,362

INSULATED STRUCTURE OF END-JOINED CANS AND STUCCOED MESH

Alvin Edward Moore, Manini Way, Diamondhead, Rte. 1, Bay St. Louis, Miss. 39520

Filed Feb. 24, 1975, Ser. No. 552,622

Int. Cl.² E04C *1/06*

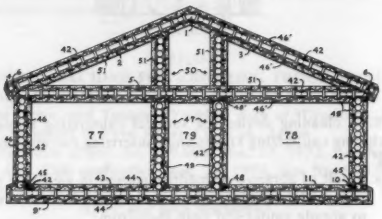
U.S. Cl. 52—91 **15 Claims**

1. Structure, including:

in upright walls, angularly joined at corners and defining an interior space, a plurality of uprightly stacked sets of intersecting, substantially horizontal rows of cans; each of said sets comprising a plurality of joints, each angularly joining a pair of said horizontal rows at one of said corners; each of said rows comprising: a plurality of end-joined, coaxial cans having substantially horizontal axes and can sidewalls each of which surrounds and encloses a canned space and can-cover elements at ends of said sidewalls; gaseous material in said cans; and connecting means fastening together ends of each pair of adjacent cans in the row;

each of said horizontal rows of cans comprising: at one of its ends a first-named row-end can-cover element which is closely adjacent to the mesh and to stucco of an outer wall surface; and at its other end a second-named can-cover element that is spaced from the mesh and stucco of another outer wall surface, the said second-named can-cover element being in contact with an intervening can sidewall that is between this second-named can-cover element and said last-named wall surface;

each of said corner joints comprising: a pair of row-end cans having intersecting axes, one of said row-end cans having a said can-end cover element in abutting relation with a can sidewall of the other of said row-end cans; and connecting means fastening said abutting cover element and sidewall, comprising a piece of strength-providing material and rod-like elements fastening said piece to said row-end cans;



the said sets of horizontal, intersecting rows of cans comprising a bottom set and a plurality of upper sets, stacked one above the other; each of said upper sets comprising at each of two diagonally-arranged wall corners a said first-named row-end can-cover element that is above a said intervening can sidewall, and at each of two other diagonally-arranged wall corners a said intervening can sidewall that is above a said first-named row-end can-cover element;

mesh, adapted to receive and hold stucco, on exterior sides of said can rows; interior wall material on inner sides of said can rows; rod-like elements, holding and positioning said mesh on said can rows; top, water-shedding structure; and means fastening said top structure to upper portions of said upright walls.

3,982,363

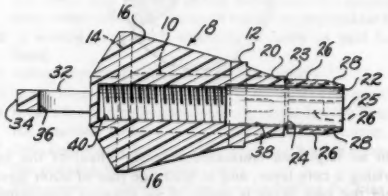
FRANGIBLE INSERT

John P. Dorris, Newport Beach, Calif., assignor to DDK Investments, Ltd., Fountain Valley, Calif.

Filed Oct. 18, 1974, Ser. No. 516,139

Int. Cl.² E04C *5/16, 5/00*

U.S. Cl. 52—98 **9 Claims**



1. An insert, comprising: a body portion adapted to be anchored in concrete, said body portion having circumferentially spaced longitudinally extending ribs on the exterior thereof for anchoring the same against rotation in said concrete; a prong at one end of said body portion adapted to be driven into a relatively smaller size hole in a mold prior to casting the concrete, said prong having circumferentially spaced longitudinally extending ridges on the exterior thereof

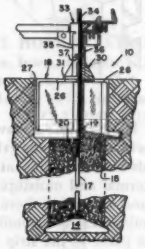
to prevent rotation thereof in said hole, said one end of said body portion being larger in outside diameter than said prong and forming an abutment for engagement with said mold, said prong having a cylindrical bore which extends completely therethrough and into said body portion, said cylindrical bore having screw threads in that portion thereof which is disposed in said body portion; and readily frangible cylindrical means between said body portion and said prong, said frangible means being formed by a narrow groove at the abutment end of said body portion and axially spacing said prong from said body portion and constituting the sole connecting means between said prong and said body portion, said prong being of such design and dimensions as to be slightly contractible when driven into said relatively smaller hole in said mold.

3,982,364

PREFABRICATED SUPPORT AND FLOOR SYSTEM FOR BUILDING

Louis W. Horvath, Huntsville, Ala., assignor to Spaceair Products, Inc., Huntsville, Ala.

Filed Aug. 23, 1974, Ser. No. 500,129
Int. Cl.² E04D *15/00*; E04B *7/02*
U.S. Cl. 52—126 **3 Claims**



1. A prefabricated support and floor system comprising: a plurality of ground support means arranged in a rectangular grid, each ground support means including connecting means providing tie flange means extending toward adjacent ground support means; a plurality of panel receiver means each connected at its ends to the tie flange means of adjacent ground support means, each panel receiver means comprising an elongated extrusion including a horizontal flange, depending central flanges extending downwardly of said horizontal flange and received in a pair of tie flange means on associated connector means, and at least one pair of horizontally elongated flanges extending upwardly of said horizontal flange and defining a horizontally elongated channel; a plurality of floor panel means, each including sheet material providing a floor and a peripheral frame defining a tongue flange received in an associated channel of associated panel receiver means and secured thereto; and wall support base means secured to and extending between adjacent ones of said ground support means and extending continuously around the periphery of said gridwork for supporting the upright walls of a building.

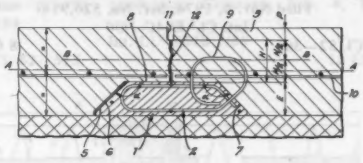
3,982,365

DISTRIBUTION BLOCKS FOR THE FORMATION OF JOINTS RESISTING TO DIFFERENTIAL SETTLING AND JOINTS OBTAINED BY USING SAID BLOCKS

Albert D. G. Noël, deceased, late of Brussels, Belgium, by Josette D. Noël, sole heir, 1160 Brussels, Belgium

Filed June 18, 1975, Ser. No. 587,984
Int. Cl.² E04B *1/62*; E01C *11/02*
U.S. Cl. 52—125 **3 Claims**

1. A distribution block, comprising: a body having a trapezoidal longitudinal section with the small base at the top, and at least one profiled bar having one end thereof embedded in said body and projecting outwardly from an inclined face thereof, the other end of said profiled bar being embedded in said body and projecting upwardly from said small base, the connecting intermediate portion of said bar connecting said



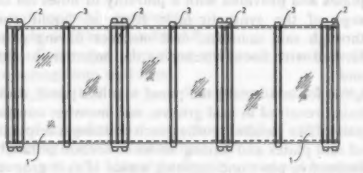
ends being disposed above the upper surface of said small base and above the surface of said inclined face, said connecting intermediate portion forming a generally U-shaped gripping element, a substantial portion of which is disposed above said body for handling the block.

3,982,366

STRUCTURAL SPACE ELEMENT

Jalo P. Haapala, Temppelikatu 8 A 23, 00100 Helsinki 10, Finland

Filed Mar. 12, 1975, Ser. No. 557,553
Claims priority, application Finland, Nov. 27, 1974, 3425/74
Int. Cl.² E04B *5/48*; E04C *1/30*
U.S. Cl. 52—220 **13 Claims**



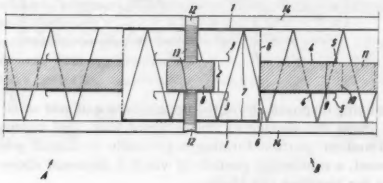
1. A building structure comprising at least two space elements, each of said space elements comprising a tube element having two generally vertical walls along with a generally horizontal floor and ceiling, each of said tube elements having first collar means transversely circumscribing the outside of the respective tube element at spaced intervals, each of said tube elements having second collar means transversely circumscribing the outside of the respective tube elements at spaced intervals, said first circumscribing collar means being arranged in alternate spaced relationship with said second circumscribing collar means along the longitudinal length of each of said tube elements, said first circumscribing collar means on each tube element protruding further from each tube element than said second collar means on each respective tube element, said two space elements being mated with one another with said first circumscribing collar means disposed opposite said second circumscribing collar means such that the first circumscribing collar means on one space element mates with the second circumscribing collar means on the other space element and the second circumscribing collar means on said one space element mates with the first circumscribing collar means on the other space element, whereby said space elements are thereby spaced from one another as determined by said mating circumscribing collar means, said space between said two space elements being adapted to accommodate conduits, insulation, utilities and the like for said building structure, said mating circumscribing collar means of said two space elements forming a beam-pillar-ring having generally horizontal beams and generally vertical pillars for supporting said building structure.

3,982,367

EDGE REINFORCEMENT FOR SANDWICH-TYPE BUILDING PANEL

Olov Jonsson, Olivedalsgatan 14 b, S-41310 Göteborg, and Edward Milaszewski, Framgangen 210-81, S-41280 Goteborg, both of Sweden

Filed Nov. 4, 1974, Ser. No. 520,914
Int. Cl.² E04C 1/00
U.S. Cl. 52—309 8 Claims



1. A construction panel comprising:

a pair of rigid plates having transversely spaced apart edges;

a hardened mass of synthetic-resin foam between said plates bonding the same together;

an elongated rigid edge-reinforcing member of laterally open box-shape received between said plates and said edges and spanning the thickness of the space between them, said member having cheeks lying along opposite internal faces of said plates and defining a laterally open groove adapted to receive a spline, said member being further formed with a section extending transverse to the plates and provided with a plurality of holes for the passage of the synthetic-resin foam in liquid condition through said member, said member having extensions formed with hooks anchoring the member in said mass; and

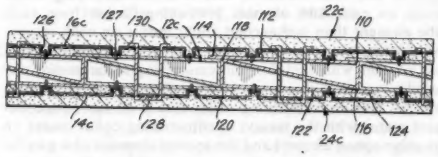
a spline for connecting the panel to a like panel, said spline being received in said groove, said member comprising a pair of like parallel profiles each abutting a respective one of said plates and having an inner section parallel to the respective plate and defining a side of said groove.

3,982,368

WALL CONSTRUCTION AND METHOD TO MAKE SAME

Arthur Perrin, Miami, Fla., assignor to American Volkscastle International Inc., Fort Lauderdale, Fla.

Continuation of Ser. No. 397,455, Sept. 14, 1973, which is a continuation of Ser. No. 173,136, Aug. 19, 1971, which is a continuation-in-part of Ser. No. 16,125, March 3, 1970. This application Dec. 18, 1974, Ser. No. 534,014
Int. Cl.² E04B 1/16
U.S. Cl. 52—381 8 Claims



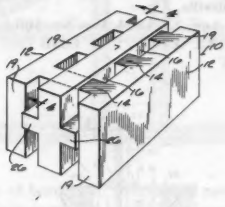
6. A wall structure comprising two parallel slabs of sprayed concrete arranged in a spaced-apart, vertical array on opposite sides of a vertically extending hollow core through which no cementitious material penetrates connecting said slabs, a layer of reticulated reinforcing material embedded within each said slab of concrete sprayed thereon and affixed to an underlying face of said core, said core comprising a plurality of elongated, hollow enclosures arranged in juxtaposition with their lengthwise dimensions vertical, each said enclosure formed from sheets of stiff, imperforate material folded to form a hollow section of rectangular cross section having a pair of opposing side faces to be positioned in the plane of the wall and perpendicular thereto a pair of verticaly extending end faces with a portion of said folded sheet extending diagonally between said side faces within said hollow section, an extension tab integral with a side face projecting outwardly beyond each hollow section to overlie a portion of the side face of each adjacent enclosure, and a plurality of rigid metal members extending transversely of said core between said layers of reinforcing material and slabs at spaced intervals.

3,982,369

INSULATED BUILDING BLOCK

Henry P. Keleske, 5515 N. Danbury Road, Milwaukee, Wis. 53217

Filed Apr. 18, 1975, Ser. No. 569,254
Int. Cl.² E04B 2/00
U.S. Cl. 52—407 3 Claims



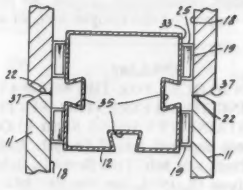
1. In a rectangular building block having spaced parallel rectangular sidewalls with spaced webs extending transversely therebetween and voids between adjacent webs, the improvement comprising a thermal and moisture insulation strip attached to said webs and extending therebetween parallel to said sidewalls, said insulation strip extending beyond the edge of said sidewalls in the plane of the strip on all four edges of the block by a predetermined amount and having edges at right angles to said plane positioned to butt against the corresponding edge of an adjacent block in any direction to accomodate a mortar joint of predetermined width when the blocks are stacked to form a wall, and further comprising laterally extending flanges in the center of said insulating strip, said flanges contacting the inner surfaces of said sidewalls and acting to obstruct air flow through the open portion of said voids.

3,982,370

WALL SYSTEM HAVING DETACHABLE WALL PANELS AND A METHOD OF ASSEMBLING SAME

Donald R. Buffington, Atlanta, Ga., assignor to Anning-Johnston Company, Orlando, Fla.

Filed Nov. 30, 1971, Ser. No. 203,134
Int. Cl.² E04B 5/52
U.S. Cl. 52—481 6 Claims



1. A panel for use in a wall assembly having a plurality of parallel or generally parallel, substantially equally spaced, magnetically attractive metal studs extending from a horizon-

tal or substantially horizontal transverse member to form a frame for receiving a plurality of said panels to form said wall assembly,

said panel comprising a panel member of predetermined length and width and having an upper edge and a back surface,

at least two generally parallel rows of elongated magnetic units disposed on said back surface of said panel member, the spacing between said rows being substantially equal to the spacing between said metal studs,

each of said magnetic units including a U-shaped iron channel member having a bight portion interconnecting a pair of leg portions, said channel members being adhesively secured to said back surface of said panel member with the leg portions extending outwardly therefrom, and each of said magnetic units including a permanent magnet disposed in each of the channels between the leg portions,

said upper edge of said panel member being insertable into said transverse member of the frame with said rows of magnetic units positioned over the metal studs to attach and hold said panel by magnetic attraction with the leg portion of each of said magnetic units in contact with a stud.

3,982,371

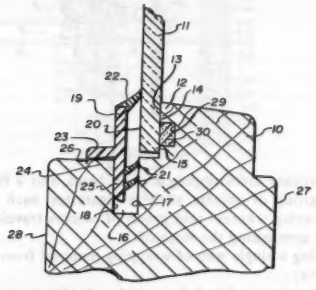
PANEL HOLDING STRUCTURE

Willi Preu, Dubuque, Iowa, assignor to Scovill Manufacturing Company, Dubuque, Iowa

Filed May 2, 1973, Ser. No. 356,293

Int. Cl.² E06B 3/58

U.S. Cl. 52—498 **1 Claim**



1. A panel holding structure, comprising: a frame; retaining step means on said frame for engaging a first side surface of an edge of said panel, the frame having a groove defined by spaced surfaces and located adjacent to said step means; and an elongated glazing stop engaging a second side surface of said panel edge, the glazing stop having a rigid stem positioned in said groove and extending therefrom adjacent to said second side surface of said panel, yieldable pressure means on said stem engaging said panel and one said groove surface for aid in retaining said stem in said groove and said panel against said step means, and a rigid flange extending from said stem adjacent to and overlying and engaging a portion of said frame adjacent said groove and on the side thereof opposite to said retaining step means, said frame portion and adjacent said groove surface being arranged at a first angle, and said rigid flange and rigid stem being arranged at a second angle embracing and smaller than said first angle, said frame portion having a surface adjacent said groove, and said flange being provided with an integral elongated sharp spur edge in pressure engagement with said frame portion surface.

3,982,372

FACADE WALL ASSEMBLY

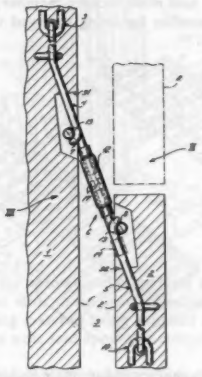
Ernst Haeussler, Grashofstrasse 47, 4300 Essen-Bredeney, Germany

Filed Jan. 20, 1976, Ser. No. 650,683

Claims priority, application Germany, Feb. 4, 1975, 2504454

Int. Cl.² E04B 2/88

U.S. Cl. 52—513 **12 Claims**



1. A wall assembly comprising:

an upright wall having a front face;

a loop of stranded wire rope anchored in said wall and projecting from said face;

a facade plate having a back face turned toward said front face;

a loop of stranded wire rope anchored in said plate and projecting from said back face;

an elongated rigid hanger having an upper end hooked into the wall loop and a lower end hooked into the facade loop, whereby said facade plate is suspended by said hanger from said wall; and

means for varying the length of said hanger between its said ends.

3,982,373

STANDING RIB ROOF

Lyle L. Wilson; Robert N. McDonald; Richard W. Mullin, and Durwood E. Graddy, all of Eufaula, Ala., assignors to American Buildings Company, Eufaula, Ala.

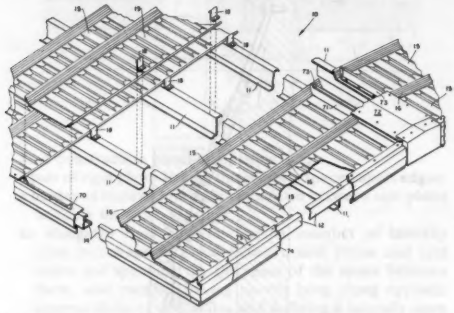
Filed May 22, 1975, Ser. No. 580,053

Int. Cl.² E04D 1/00

U.S. Cl. 52—588 **7 Claims**

1. A standing rib roof structure for installation on the framing of a building including purlins for supporting said roof structure, said roof structure comprising a plurality of panels, each of said plurality of panels including: a first raised edge extending generally longitudinally of said panel, a male locking member carried on said first raised edge and arranged substantially perpendicularly to said panel to be substantially perpendicular to said purlins, a plurality of locking lips spaced along said male locking member and facing downwardly towards said purlins; a second raised edge extending generally longitudinally of said panel and parallel to said first raised edge, a female locking member carried on said second raised edge, said female locking member being arranged substantially perpendicularly to said panel to be substantially perpendicular to said purlins and substantially parallel to said male locking member, a locking lip extending along said female locking member and facing upwardly; said male locking mem-

ber and said female locking member being so constructed and arranged that said female locking member is receivable over said male locking member through motion directed along said male locking member generally perpendicular to said purlins and said locking lip of said female locking member will be engaged under said locking lips of said male locking member; said roof structure further including a plurality of panel clips, each panel clip of said plurality of panel clips including a hermaphroditic locking member comprising a secondary female locking member for receiving said male locking member, a locking ledge facing upwardly for engaging one of said locking lips on said male locking member, and a secondary male locking member for being received within said female



locking member, said secondary male locking member including a downwardly facing locking lip for engaging said locking lip on said female locking member, said panel clips being so constructed and arranged that said secondary female locking member is engageable with said male locking member through motion directed along said male locking member generally perpendicular to said purlins, and said female locking member is engageable with said secondary male locking member through motion directed along said secondary male locking member generally perpendicular to said purlins, said female locking member being engageable with said secondary male locking member both with and without said secondary locking member's being engaged with said male locking member.

3,982,374

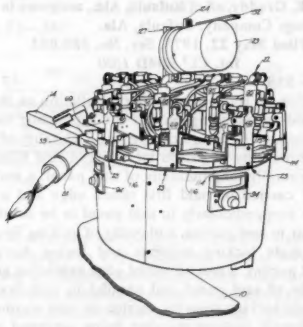
APPARATUS AND METHOD FOR CONTINUOUSLY FORMING AND FILLING TAMPON SACKS

Jean E. Schaefer, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed July 1, 1974, Ser. No. 484,813

Int. Cl.² B65B *9/12*

U.S. Cl. 53—28 **16 Claims**



1. A method of forming and filling flexible tubing to provide closed tubular packages having compact end closures concentric with the longitudinal axis of the tubing, comprising the steps of continuously advancing a length of flexible tubing in a path of travel, engaging and gathering the tubing radially inwardly at a first point and fastening together the gathered tubing to form a leading end closure, introducing a charge of filling material into the tubing from its trailing end and propelling the charge forwardly through the tubing until it comes to rest at said leading end closure, engaging and gathering the tubing radially inwardly at a second point spaced rearwardly from said first end closure and lying beyond the charge of filling material, and fastening together the gathered tubing at said second point to form a closed package containing the charge of filling material, and thereafter sequentially forming and filling additional packages in like manner, with the trailing end closure of the package just formed also serving as the leading end closure for the next to be formed package.

3,982,375

PROCESS AND A DEVICE FOR WRAPPING ARTICLES, MORE PARTICULARLY, GROUPS OF CIGARETTES

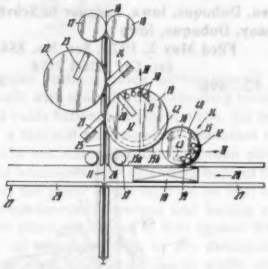
Heinz Focke, Verden, Aller, Germany, assignor to Focke & Pfuhl, Verden, Aller, Germany

Filed Feb. 19, 1975, Ser. No. 551,211

Claims priority, application Germany, Feb. 19, 1974, 2407767

Int. Cl.² B65B *11/16, 19/22*

U.S. Cl. 53—32 **17 Claims**



1. A process for wrapping a main blank and a flap blank about a group of objects, such as cigarettes, such that said blanks overlap wherein said group of objects travels along a first path comprising the steps of:

a. feeding a single web of wrapping material from a supply source;

b. cutting a main blank from said web of material;

c. cutting a flap blank from said web of material;

d. feeding said flap blank in a second path to place it on the group of objects;

e. feeding the main blank in a third path which intersects the first path of travel of the group of objects; and

f. folding said main blank around said group of objects such that a portion overlaps said flap blank.

3,982,376

APPARATUS FOR FILLING AND SEALING RETORT FOODS

Masaomi Ikeda, Yokohama, Japan, assignor to Toyo Seikan Kaisha Limited, Tokyo, Japan

Filed June 27, 1975, Ser. No. 591,258

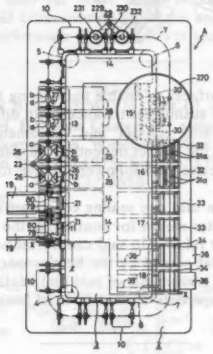
Claims priority, application Japan, Sept. 4, 1974, 49-101605

Int. Cl.² B65B *57/02, 3/12, 43/36*

U.S. Cl. 53—53 **18 Claims**

1. A filling and sealing apparatus for a plurality of retort pouches to store retort food stuffs comprising, in combination, an endless transfer means having a plurality of gripper means which are equally spaced from each other, said endless trans-

fer means being intermittently movably disposed around an outer periphery of a platform, a first station including a plurality of pouch supplying means which are disposed in searies with respect to a travelling path of the retort pouches and a plurality of actuating means to actuate said grippers, said actuating means being actuable to cause said gripper means to grip the retort pouches, a second station including a plurality of retort pouch opening means and a plurality of retort pouch dilating means associated therewith to open and dilate the retort pouches gripped by said gripper means, said second station being located in the travelling path of the retort pouches at a position adjacent said first station, a third station located in the travelling path of the retort pouches at a position adjacent said second station and including a plurality of sensing means to sense opened conditions of the respective retort pouches for generating an electric signal when a defectively opened retort pouch is sensed, and a plurality of gripper releasing means responsive to the electric signal to cause said gripper means to release the retort pouch having a defective opening, a fourth station disposed in the travelling path of the retort pouches at a position spaced from the third station and



including means for supplying solid materials into the retort pouches, a fifth station disposed in the travelling path of the retort pouches at a position spaced from the fourth station and including means for supplying viscous liquid into the retort pouches in which the solid materials is put, a sixth station disposed in the travelling path of the retort pouches at a position adjacent said fifth station and including a dilating means to release remaining air from the respective retort pouches and primary sealing means to primarily seal the opening portions of the respective retort pouches, a seventh station disposed in the travelling path of the retort pouches at a position adjacent the sixth station and including a secondary sealing means to secondarily seal the opening portions of the respective retort pouches which have been primarily sealed, an eighth station disposed in the travelling path of the retort pouches at a position adjacent the seventh station and including a cooling means to cool the sealed portions of the respective retort pouches for thereby solidifying the sealed portions and a releasing means to release the retort pouches, and driving means having means to intermittently move said endless transfer means at a preselected speed.

3,982,377

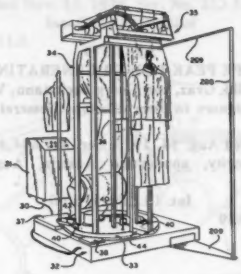
AUTOMATIC BAGGING MACHINE

Charles C. Vanderpool, Waverly, N.Y., assignor to BMT Manufacturing Corporation, Elmira, N.Y.

Continuation of Ser. No. 141,882, May 10, 1971. This application May 7, 1974, Ser. No. 467,679

Int. Cl.[2] B65B *57/00, 43/30*

U.S. Cl. 53—66 **29 Claims**



26. Apparatus for automatically applying a bag, closed at the sides and one end, to an item supported at a bagging station, the bagging material being supplied in tubular form from a continuous web, said apparatus comprising, in combination;

a. means for engaging and holding the leading end of said web in open condition;

b. power driven means for moving said open end over the items;

c. means for effecting a seal transversely of said web at a distance from said leading end in predetermined relation to the length of the item;

d. means for severing said web transversely, adjacent the areas of said seal, thereby forming an individual bag from the severed portion and a new leading end for movement over the next item; and

e. means for releasing said engaging means from said open end of the individual bag.

3,982,378

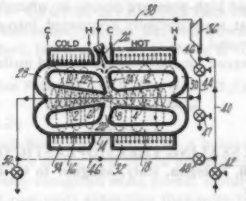
ENERGY CONVERSION DEVICE

Joachim S. Sohre, 1 Lakeview Circle, Ware, Mass. 01082

Filed Mar. 13, 1975, Ser. No. 557,953

Int. Cl.[2] F25B *9/02*

U.S. Cl. 60—650 **27 Claims**



15. An energy exchange system including:

a casing having a fluid separation chamber therein;

annular inner bodies in the casing at opposite sides of and defining the chamber, each inner body being spaced from the walls of the chamber to define an annular passage surrounding the body and communicating with the chamber, each annular passage communicating at its end remote from the chamber with the axial passage within the associated inner body, said axial passages in the inner bodies also communicating with the chamber, thereby

establishing a continuous duct through the annular passage and the axial passage for a return flow of fluid from the chamber;

nozzle means for delivering a helical flow of operating fluid into said chamber for a separation of the fluid into hot and cold streams with one stream flowing around each inner body; and

energy exchange means associated with each inner body for changing the energy level in the streams flowing around the inner bodies.

3,982,379

STEAM-TYPE PEAK-POWER GENERATING SYSTEM

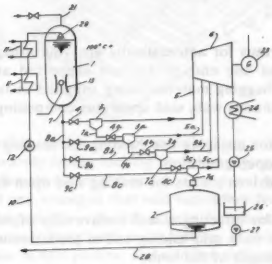
Paul Viktor Gilli, Graz, and Georg Beckmann, Vienna, both of Austria, assignors to Siempelkamp Giesserei KG, Krefeld, Germany

Filed Aug. 14, 1975, Ser. No. 604,811

Claims priority, application Austria, Aug. 14, 1974, 6641/74

Int. Cl.² F01K *3/00*

U.S. Cl. 60—659 **17 Claims**



1. A steam system comprising:

a high-pressure generally closed reservoir;

means for heating a body of water in said high-pressure reservoir above 100°C;

a low-pressure generally closed reservoir;

a discharge conduit connected between a lower region of said high-pressure reservoir and said low-pressure reservoir for conducting heated water from the former toward the latter;

an expansion-type steam generator in said conduit and having a steam outlet;

a restriction in said discharge conduit between said generator and said high-pressure reservoir, whereby said heated water is at least partially converted into steam in said generator; and

a steam-powered load connected to said outlet of said generator.

3,982,380

DEVICE FOR SEALING THERMOPLASTIC OVERWRAPS

Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa per Azioni, Italy

Filed June 24, 1975, Ser. No. 589,896

Claims priority, application Italy, July 10, 1974, 3439/14

Int. Cl.² B65B *51/14*

U.S. Cl. 53—77 **3 Claims**

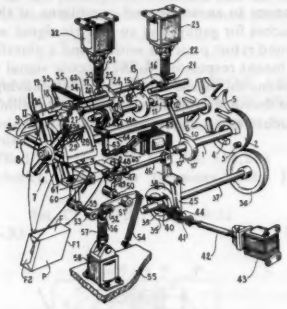
1. A device for sealing thermoplastic overwraps on cigarette packets, comprising;

packet-transferring means having means for moving it at a plurality of speed levels subject to periodic halts, the transferring means being receptive during each halt of a cigarette packet and of thermoplastic overwrap material for it at a first station, and having successive halting stations for successively heat-sealing the thermoplastic overwrap material on a single portion of the packet;

successive sealing contrivances, one disposed at each successive station in a position adjacent the transferring means, each contrivance being mounted for movements back and forth into and from contact with said single portion of the packet;

support means for each sealing contrivance, supporting it in said position for effecting said movements at a speed dependent on said speed levels;

control cam means having a follower linkage including a cam follower, for performing the movements of each sealing contrivance, and having a cam which has a plurality of cam surfaces to enable performing the movements of one of the sealing contrivances with different ratios of movements into contact and movements away from contact with the packet depending on different positions of the respective cam follower relative to said cam surfaces;



a heat sensor in said one sealing contrivance; and

heat compensator means for controlling the position of the cam follower relative to said cam surfaces in response to a level of heat sensed by the heat sensor to control the ratios of the movements of said one heating contrivance so as to compensate for the level of heat sensed by the heat sensor.

3,982,381

APPARATUS FOR TRANSVERSELY SEALING A WRAPPER HOSE

Hans-Ulrich Bolli, Schleitheim, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Germany

Filed Feb. 4, 1976, Ser. No. 655,248

Claims priority, application Switzerland, Feb. 4, 1975, 1323/75

Int. Cl.² B65B *51/16*

U.S. Cl. 53—180 R **2 Claims**

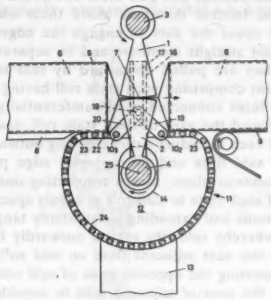
1. In an apparatus for periodically forming transverse seams in a longitudinally advanced wrapper hose for transversely sealing the wrapper hose between articles previously arranged therein, the apparatus including cooperating rotary upper and lower sealing shoes between which the wrapper hose passes and which periodically pinch the wrapper hose walls together and transversely seal them to one another; the lower sealing shoe being affixed to a rotary shaft; the improvement comprising

a. a drive arm affixed to said shaft spaced from said lower sealing shoe and being in alignment therewith;

b. means defining a radially extending guide groove in said drive arm;

c. two connecting rods jointed to one another by a joint pin extending into said groove and being radially slidable therein; and

d. a flexible bar grate arranged to support the wrapper hose in the zone of said sealing shoes and formed of a plurality of parallel-spaced, interconnected bars; two of said bars constituting end bars articulated to the one and the other connecting rod; the space between the two end bars being



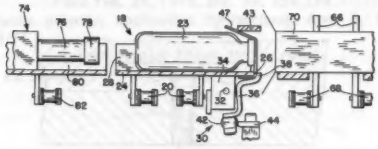
greater than the space between any other two bars; said lower sealing shoe projecting into the space between said end bars; said bar grate being rotated by said shaft through said drive arm, said joint pin and said connecting rods in synchronism with said lower sealing shoe.

3,982,382

ARTICLE BUCKET WITH CIRCULAR CLAMP

Walter H. Vogel, Hoffman Estates, Ill., assignor to Crompton & Knowles Corporation, Worcester, Mass.

Filed May 22, 1975, Ser. No. 579,767
Int. Cl.² B65B *5/04*
U.S. Cl. 53—252 **6 Claims**



1. In a packaging machine having a conveyor with a plurality of buckets thereon for carrying articles and means for transferring the articles from the buckets into cartons, the improvement comprising:

a. each article bucket having a bottom plate with a top surface, a bottom surface and a front edge over which the article is transferred into a carton;

b. a clamp mounted on said article buckets and having a clamping jaw which is movable between a closed position and an open position, wherein said clamping jaw is effective, in open position, to allow a leaflet to be partially inserted between the bottom surface of said article bucket and said clamping jaw so that the remaining portion of said leaflet extends horizontally beyond the front edge of said article bucket and effective, in the closed position, to deflect the horizontally extending portion of an inserted leaflet to a substantially vertical position and to clamp said leaflet against said front edge;

c. means for inserting a leaflet between said bottom surface and said open clamping jaw; and

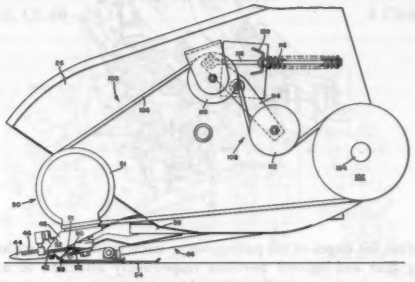
d. means for opening and closing said clamp so that said clamp is open to receive a leaflet, closed to deflect and clamp said leaflet, and opened to release said leaflet for transfer of an article from said bucket, whereby said article will engage the vertically extending portion of said leaflet as it passes over the front edge of said bucket and carry it into a carton.

3,982,383

HARVESTING PLATFORM WITH A FLOATING CUTTER BAR

Roger Eugene Mott, Bettendorf, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Nov. 13, 1974, Ser. No. 523,509
Int. Cl.² A01D *69/08*
U.S. Cl. 56—11.6 **17 Claims**



1. A harvesting platform for a mobile harvesting machine comprising: a transversely elongated platform frame having opposite sides; a platform floor extending between the opposite sides; a transverse flexible cutter bar assembly including a reciprocatable sickle, extending between the opposite sides forwardly of the floor and operative to flex vertically to a limited degree to follow the contour of the ground; means mounting the cutter bar assembly on the platform frame for vertical adjustment relative thereto so that the cutter bar assembly follows the contour of the ground; a drive mechanism having a rotary input element and a reciprocating output element drivingly connected to the sickle, the drive mechanism being mounted on one end of the cutter bar assembly for vertical adjustment therewith, and a belt drive means mounted on one side of the platform frame on the same side of the platform as the drive mechanism and operatively connected thereto, said belt drive means including belt tensioning means operative to to provide belt tension regardless of the vertically adjusted position of the drive mechanism relative to the platform frame.

3,982,384

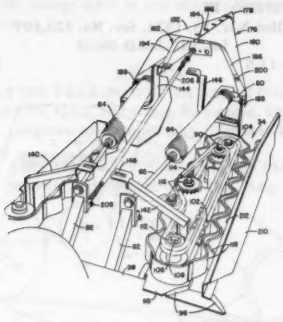
ROW CROP HARVESTING HEADER

Glen Willard Rohweder, Moline, Ill., and Edward John Hengen, Bettendorf, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Feb. 21, 1975, Ser. No. 551,526
Int. Cl.² A01D *45/02*
U.S. Cl. 56—106 **38 Claims**

1. A row crop harvesting header for a harvesting machine adapted to advance over a field of row planted crops, comprising: a transversely elongated main frame; a plurality of transversely spaced row units extending forwardly from the main frame, each row unit including a row unit frame, means mounting the row unit frame on the main frame for independent vertical floating adjustment of the forward end of the row unit, a pair of laterally spaced elements mounted on the row unit frame and defining a generally fore and aft passageway adapted to receive a row of crop material as the machine advances, conveyor means mounted on the row unit frame and having opposite rearwardly moving inner runs on opposite sides of the passageway and operative to engage the crop material and move it rearwardly along the passageway, and cutting means mounted on the row unit frame generally below

the forward end of the conveyor means for severing the crop material relatively close to the ground as the crop material moves rearwardly along the passageway; a hood means respectively mounted on each pair of adjacent row units and covering the area between the passageways of the adjacent row units, the opposite sides of each hood means at least partly forming said pair of laterally spaced elements that



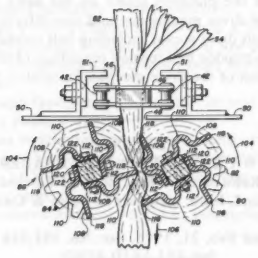
define the edges of the passageways, each hood means including first and second portions respectively attached to and independently vertically adjustable with the respective adjacent row units; and a forwardly converging divider member respectively mounted on each pair of adjacent row units and extending forwardly from the hood means, the forward end of each divider member moving between the adjacent rows as the machine advances.

3,982,385

STALK ROLLS FOR CORN HARVESTERS

Myles Hyman, Lancaster, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed July 3, 1975, Ser. No. 592,964
Int. Cl.[2] A01D *45/02*
U.S. Cl. 56—106 6 Claims



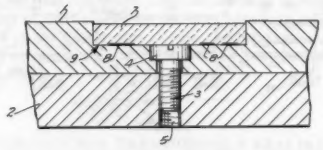
1. In a row crop corn harvester header attachable to a forage harvester and including a plurality of shield units spaced transversely apart to provide an elongated passage therebetween to receive corn stalks for the removal of ears therefrom by said header, each unit having a straight member extending longitudinally along one side of each passage and having an edge coacting with an edge on the straight member on the adjacent unit to define a narrow stripping slot through which corn stalks can pass but not the ears, endless flexible members having lugs spaced therealong and supported for movement of an elongated span thereof along one side of said elongated passage adjacent and substantially parallel to said edge of said straight member on said unit, means to drive said endless flexible members to move said elongated spans thereof on opposite sides of said passage in similar directions to positively move corn stalks along said passage and narrow slot, stalk rolls carried by each unit adjacent said passage in substantially parallel relation to and beneath said straight members, and means to rotatably drive said rolls on opposite sides of said passage in opposite rotary directions to engage corn stalks in said passage and pull them downward as the lugs on said endless flexible members move them along said slot, thereby to cause the ears to engage the edges of said slot between said straight members and be separated from said stalks as they are pulled downward by said stalk rolls; the improvement comprising each stalk roll having a plurality of elongated flutes connected in circumferentially spaced relationship around the axes of each stalk roll, said flutes being similar and each including a rib extending outwardly from one surface of said flute and the opposite edge portions being within a common plane, means connecting one of said edge portions of each flute to said roll at evenly spaced circumferential positions and extending substantially tangentially from said roll, whereby said ribs extend outwardly from the edge portion of the next adjacent flute on said roll, and bearing means supporting the opposite ends of said rolls in positions to dispose the axes of adjacent rolls in suitable positions to enable the outermost edges of the outer edge portions of said flutes on one roll to be suquentially spaced from the ribs on the other roll a distance appreciably less than the diameter of corn stalks engaged thereby, and means to index said rolls to effect such sequential relation of successive outer edges and ribs of said flutes as said rolls are rotated.

3,982,386

WATCHES, AND A METHOD OF MAKING THEM

Jean-Jacques Desaules, 3, rue Beau-Site, 2416 Les Brenets, Switzerland

Continuation-in-part of Ser. No. 343,436, March 21, 1973, abandoned. This application May 16, 1975, Ser. No. 578,113
Claims priority, application Switzerland, Mar. 23, 1972, 4318/72; Mar. 23, 1972, 4319/72
Int. Cl.[2] G04F *1/00*
U.S. Cl. 58—1 R 10 Claims



1. A method of making watch movements with sequential serial markings, comprising;

making a recess in a surface porton of each of a series of plate portions of uniform watch movements, at a location which is visible during service and repair of the corresponding watch movement, the recess having a maximum extension over the plate portion which is small compared with a radius of the watch movement;

fitting a series of plaques, each into one of the recesses, each plaque carrying a sequential serial marking; and

attaching the fitted plaque to each of said plate portions, in the corresponding recess, to sequentially serially mark the watch movements.

3,982,387

SOLID STATE ELECTRONIC TIMEPIECE

Kojiro Tanaka, Yachiyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Dec. 24, 1974, Ser. No. 536,106
Claims priority, application Japan, Dec. 25, 1973, 49-3971
Int. Cl.[2] G04B *19/30*
U.S. Cl. 58—50 R 8 Claims

1. In an electronic timepiece: an oscillator for producing a high frequency time signal suitable as a time standard; means

receptive of the time signal for dividing it into at least hour, minute and second drive signals; time display means receptive of the hour and minute drive signals for displaying the time in hours and minutes; and second display means receptive of the second drive signal for continuously displaying an indication of the time in seconds, said second display means comprising six energizable display elements operalble when energized to

provide a light output, and circuit means responsive to the second drive signal for repeatedly and sequentially energizing said six display elements at ten-second intervals to effet flashing of each display element at one-second increments for a period of ten seconds to obtain a repeating succession of flashing light outputs at one-second increments thereby displaying a continuous indication of the time in seconds.

3,982,388

DIGITAL DISPLAY MECHANISM FOR A TIME-KEEPER

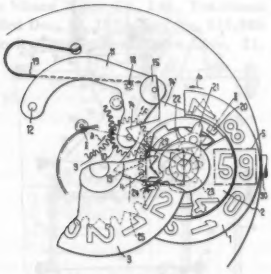
Charles Guyot, Tavannes, and Jacques Muller, Reconvilier, both of Switzerland, assignors to Ebauches Tavannes SA, Tavannes, Switzerland

Filed Feb. 28, 1975, Ser. No. 554,139

Claims priority, application Switzerland, Apr. 5, 1974, 4839/74

Int. Cl.² G04B *27/06, 19/24, 19/02*

U.S. Cl. 58—85.5 **7 Claims**



1. An instantaneous digital display mechanism for a timekeeper comprising a first indication disc, a second indication disc adjacent thereto, dirve mechanism including a first toothed wheel connected to said first indication disc, a driving wheel, an intermediate wheel in engagement with said first toothed wheel and said driving wheel, a main lever on which said intermediate wheel is pivoted, a ratchet wheel connected to said first indication disc, a dog on said main lever engageable with the teeth of said ratchet wheel, and means to correct said display mechanism, said dog being disengageable from said ratchet wheel by the automatic displacement of the said main lever by cooperation of said driving wheel, said intermediate wheel and said first toothed wheel during normal working and also by the manual displacement of the said main lever by the said means to correct said display mechanism.

3,982,389

ELECTRONIC FUEL CONTROL FOR A GAS TURBINE ENGINE

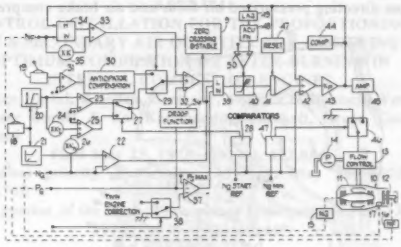
Paul Manwaring Maker, Loughton, England, assignor to Lucas Industries Limited, Birmingham, England

Filed July 7, 1975, Ser. No. 593,300

Claims priority, application United Kingdom, July 9, 1974, 30315/74

Int. Cl.² F02C *3/10*

U.S. Cl. 60—39.16 R **4 Claims**



1. An electronic fuel control for a gas turbine engine having a gas turbine gas generator and a separate power turbine driven by the gas generator, the fuel control comprising an integrator, an output difference amplifier for comparing the output signal of said integrator with a gas generator actual speed signal derived from a gas generator speed transducer, a fuel flow control actuated by said output difference amplifier for varying the fuel flow to the engine, means for generating a power turbine speed demand signal, a power turbine actual speed transducer for producing a power turbine actual speed signal which is higher than the output signal of said output difference amplifier in normal use, a "highest wins" gate circuit having input terminals connected respectively to said power turbine actual speed transducer and to the output terminal of said output difference amplifier and an output terminal at which the higher of the signals at its two input terminals appears in use, a further difference amplifier connected to receive the output of said gate with an attenuated signal derived from the power turbine actual speed transducer, said attenuated signal being so attenuated that in normal running conditions the output of the further difference amplifier is less than the output signal of the output difference amplifier, a power turbine speed difference amplifier connected to receive said power turbine speed demand signal and the output signal of said further difference amplifier to produce a power turbine speed error signal which is of positive polarity when the power turbine speed demand signal exceeds the output signal from said further difference amplifier and means connecting the output terminal of the power turbine speed difference amplifier to the input terminal of the integrator.

3,982,390

GAS TURBINE ENGINE COOLING SYSTEM

Albert H. Bell, III, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

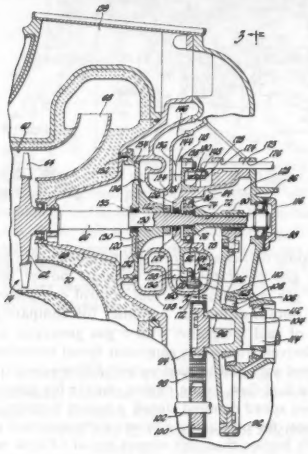
Continuation of Ser. No. 499,480, Aug. 22, 1974, abandoned. This application Jan. 7, 1976, Ser. No. 647,449

Int. Cl.² F02C *7/02, 7/12*

U.S. Cl. 60—39.16 R **1 Claim**

1. In a two-shaft gas turbine engine of the type including a first shaft having an engine compressor on one end thereof and a gasifier turbine on the opposite end thereof and a power

turbine shaft having a power turbine on one end thereof and means coupled thereto for transferring power from the power turbine shaft to an output power shaft and wherein housing means are located radially outwardly of and circumferentially of said power turbine means, the improvement comprising: an air brake compressor including a centrifugal impeller connected to said power turbine shaft on the opposite end thereof from the power turbine thereon, a plurality of blades on said impeller each having an axial inlet and a radial outlet, inlet and discharge duct means for directing ambient pressure air into said air brake compressor and for directing pressurized air therefrom, means forming a cooling chamber arranged circumferentially around and radially outwardly of the housing means, means forming an outlet from said cooling chamber in communication with atmosphere for maintaining said cooling chamber at atmospheric pressure, said discharge duct means directing pressurized air from said air brake compressor into said cooling chamber for flow therethrough to atmosphere for cooling the engine turbine during operation thereof, said air brake compressor absorbing energy from the power turbine shaft and compressing ambient air for flow through said cooling chamber and subsequent discharge to atmosphere during engine operation, means including inlet guide vanes having a first control position to direct an elevated mass air flow through the compressor to produce an elevated power absorption by the air brake compressor during a first engine operating mode and to produce pressurized air flow through said cooling chamber during the first engine operating condition, said inlet guide vanes having a second position to throttle air flow into said compressor to produce a mass air flow therethrough less than said first mass air flow thereby to produce a minimum power absorption during a second engine operating condition and a continued flow of pressurized air through said atmospheric cooling chamber for cooling the engine during the second condition of operation thereof.



3,982,391

APPARATUS AND PROCESS FOR MECHANICAL POWER PRODUCTION BY ACETYLENE COMBUSTION

Orr E. Reynolds, 6828 Granby St., Bethesda, Md. 20034

Filed Sept. 20, 1974, Ser. No. 507,591

Int. Cl.[2] F02B *43/00;* **F02C** *3/20*

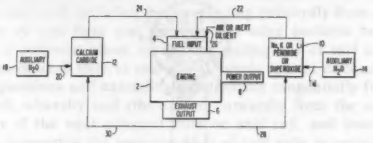
U.S. Cl. 60—39.02 **17 Claims**

1. An apparatus, comprising:

a. a combustion engine having a combustion zone for burning acetylene with an oxygen-containing gas to produce mechanical power and exhaust gases including H_2O and oxides of carbon, the combustion engine including fuel input means, exhaust output means and power output means;

b. a first structure defining a reaction zone for containing a compound selected from the group consisting of sodium peroxide, potassium peroxide, lithium peroxide, sodium superoxide, potassium superoxide and lithium superoxide for reacting H_2O with the compound to produce oxygen and for reacting oxides of carbon with by-products of the reaction of the H_2O with the compound;

c. a first conduit connecting the exhaust means to the first structure for supplying exhaust gases, including H_2O and oxides of carbon, thereto;



d. a second conduit connecting the first structure to the fuel input means for supplying oxygen thereto;

e. a second structure defining a reaction zone for containing calcium carbide for reacting H_2O with the calcium carbide to produce a product consisting essentially of calcium oxide and aceytlene and for reacting oxides of carbon with the calcium oxide;

f. a third conduit connecting the exhaust means to the second structure for supplying exhaust gases, including H_2O and oxides of carbon, thereto; and

g. a fourth conduit connecting the second structure to the fuel input means for supplying acetylene thereto.

3,982,392

COMBUSTION APPARATUS

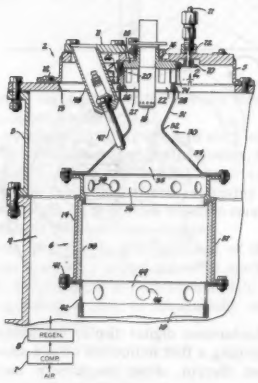
David E. Crow, Glastonbury, Conn., assignor to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 502,277, Sept. 3, 1974, abandoned.

This application Jan. 19, 1976, Ser. No. 650,242

Int. Cl.[2] F02C *7/22*

U.S. Cl. 60—39.23 **1 Claim**



1. In combustion apparatus for a gas turbine engine comprising, in combination, means defining a housing adapted to receive a flow of hot compressed air, a combustion liner in the housing comprising liner wall means extending from the upstream end of the liner to the downstream end thereof, said liner wall means including prechamber wall means having a

converging wall portion and a downstream streamlined imperforate throat section both defining a noncombustion fuel prevaporization chamber, said throat section defining an outlet from the prevaporization chamber, said liner wall means including a diverging cone connected to said throat section to define a combustion reaction chamber downstream of said throat section, a fuel spray nozzle supported on said liner wall means including a tip portion thereon located concentrically within said prevaporization chamber and spaced axially upstream of said imperforate throat section and operative to direct a fuel spray into said prevaporization chamber, said prechamber wall means including a primary air swirler for admitting hot compressed air from the housing into said prevaporization chamber, said swirler being variable in effective area to vary the primary air flow swirl into said prevaporization chamber to control the degree of mixing between said fuel spray and said primary air as well as the air fuel ratio thereof, said imperforate throat section providing a smooth flow path for mixed air and fuel from the noncombustion prevaporization chamber across the inner wall of said downstream diverging cone for maintaining a flame front on the inner surface of said diverging cone downstream of said throat section, said liner wall means including a row of primary air ports immediately adjacent to and downstream of the diverging cone at the downstream end of the combustion reaction chamber for admitting additional primary combustion air radially into the combustion reaction zone, said diverging cone diverging from the longitudinal axis of said liner wall means at an angle of about 33° and said cone having a length with respect to the diameter of said throat section to produce a ratio of cone length to throat diameter in the range of 2.0 through 2.2 for maintaining a flow of noncombusted prevaporized and mixed fuel and air from the prevaporization chamber into said combustion reaction chamber and to maintain the flame front on the inner wall of said diverging cone downstream and exteriorly of said prevaporization chamber, said combustion reaction chamber having an outlet diameter about four times that of said throat to prevent undesirable entrance of the flame front from said reaction chamber into said noncombustion prevaporization chamber.

3,982,393
INTERNAL COMBUSTION ENGINE EXHAUST CLEANING METHOD AND SYSTEM

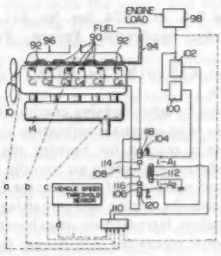
Kenji Masaki, and Masaaki Saito, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 12, 1974, Ser. No. 531,986

Claims priority, application Japan, Dec. 21, 1973, 48-143296

Int. Cl.² E02B 75/10

U.S. Cl. 60—274 **14 Claims**



2. A method of cleaning exhaust gases from a multicylinder internal combustion engine comprising the steps of:

supplying a first air-fuel mixture richer than stoichiometric mixture into a first group of engine cylinders consisting of more than half the number of total cylinders of the engine and a second air-fuel mixture leaner than stoichiometric mixture into a second group of engine cylinders consisting of the remaining cylinders of the engine during low load engine operation;

supplying the first air-fuel mixture into the second group of engine cylinders and the second air-fuel mixture into the first group of engine cylinders during medium and high load engine operation; and

afterburning in an afterburner the gases discharged from all the engine cylinders;

whereby the temperature in the reburning means is rapidly elevated so that the reburning means effectively functions during the low load engine operation, while the temperature is prevented from excessive elevation during medium and high load engine operation.

3,982,394
CONTROL INSTALLATION FOR THE PROPORTIONING OF A SECONDARY AIR QUANTITY FOR ACHIEVING OPTIMUM COMBUSTION OR AFTER-BURNING IN INTERNAL COMBUSTION ENGINES

Gunter Hartel, Rosellen, Germany, assignor to Deutsche Vergaser GmbH & Co. Kommanditgesellschaft, Neuss, Germany

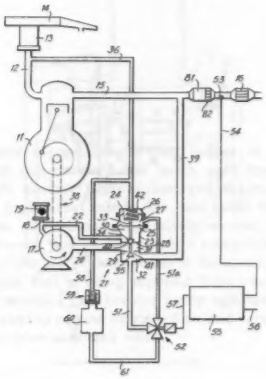
Filed May 23, 1974, Ser. No. 472,884

Claims priority, application Germany, May 25, 1973, 2326718

The portion of the term of this patent subsequent to Jan. 13, 1976, has been disclaimed.

Int. Cl.² F02B 75/10

U.S. Cl. 60—276 **3 Claims**



1. An installation for the proportionate addition of secondary air employed in the optimum after-burning of the exhaust gases of an internal combustion engine, including; an engine-driven air pump, control means for introducing predetermined quantities of said secondary air; means located externally of said control means being responsive to at least one of a plurality of engine operating conditions consisting of the pressure of the engine suction side, the engine exhaust gas back-pressure, engine rotational speed, exhaust gas oxygen content, and exhaust gas carbon monoxide content for regulating said control means; said control means including means for the withdrawal of a protion of the secondary air conveyed through said control means and conducting said withdrawn secondary air to the suction side of said air pump, said air pump returning said secondary air from the pressure side of said air pump to said control means; means for determining the rate of feed of the secondary air and the quantity of the air portion withdrawn from said control means to said air pump, said means including two spaced conical valve means controlling flow passages through said control means, said valve means being mounted on a common actuating control rod and being posi-

tioned so that, during an increase of the fed quantity of second air, the quantity of the withdrawn air portion is reduced, said actuating control rod for said conical valve means being rigidly connected to two spaced upper and lower membranes having unequal operative surfaces, said membranes defining therebetween a first control pressure chamber communicating with the exhaust gas back-pressure of said engine, and a second control pressure chamber located above the upper membrane communicating with the suction side pressure of said engine, the improvement comprising: sensor means for measuring the oxygen content or carbon monoxide content in the exhaust gas; a catalytically operative element being positioned upstream of said sensor means for converting deleterious materials in said exhaust gas into other harmless materials.

3,982,395

EXHAUST SYSTEM FOR MULTI-CYLINDER INTERNAL COMBUSTION

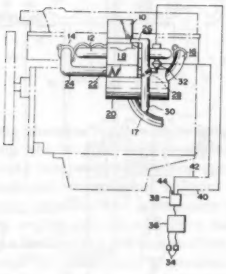
Kohichi Hasegawa, Mishima, and Toshiaki Konomi, Susono, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed June 16, 1975, Ser. No. 587,052

Claims priority, application Japan, Feb. 10, 1975, 50-17867[U]

Int. Cl.² F02M *25/06*

U.S. Cl. 60—278 **5 Claims**



1. An exhaust system for a multi-cylinder internal combustion engine, comprising:

an exhaust gas recirculating circuit connected to an exhaust pipe of one engine cylinder for recirculating to an intake manifold of the engine the entire amount of exhaust gas which is discharged from said one engine cylinder;

switching means provided in said exhaust gas recirculating circuit for switching the flow of the recirculating exhaust gas in response to a value of a predetermined parameter indicating particular operating conditions of said engine;

heat exchanging means provided in said exhaust gas recirculating circuit in contact with said intake manifold of said engine for heating said intake manifold by heat exchange with said recirculating exhaust gas; and

a reactor provided in the exhaust manifold of said engine for receiving for cleaning purposes the entire amount of exhaust gases which are discharged from engine cylinders other than said one engine cylinder.

3,982,396

THERMAL REACTOR WITH SLIDABLE SUPPORTS FOR INNER CORE

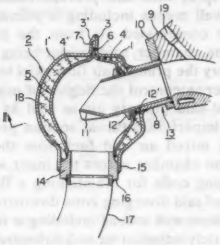
Motoo Suzuki, Kyoto, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 28, 1975, Ser. No. 581,651

Claims priority, application Japan, Sept. 6, 1974, 49-103186

Int. Cl.² F01N *3/10, 7/10*

U.S. Cl. 60—282 **3 Claims**



1. A thermal reactor comprising a shell formed from two pieces having flanges extending outwardly from the interior of the shell, which pieces are joined to each other at the flanges thereof and which flanges define a concave portion, a tubular core formed from two pieces having flanges extending outwardly from the interior of the core, which second-named pieces are joined to each other at the flanges thereof and which flanges define a convex portion, said convex portion being slidably supported within said concave portion, said core having a discharge opening, said shell having an outlet open end, a space being provided between said shell and core, at least one inlet pipe secured to said shell and extending therethrough into the core, seal ring means slidably positioned on the inlet pipe and engaging the core in a fluid tight manner, and an outlet pipe secured at one end to said core to connect to said opening, said outlet pipe also being secured at a peripheral portion thereof to the outlet open end in said shell, and adiabatic material having high heat resistance in the space defined between said shell and core, an outlet end of said outlet pipe being connected to an exhaust pipe of an engine.

3,982,397

APPARATUS FOR AFTERBURNING THE EXHAUST GASES OF AN INTERNAL COMBUSTION ENGINE TO REMOVE POLLUTANTS THEREFROM

Pierre Alfred Laurent, 62, Avenue Theophile Gautier, 75016 Paris, France

Filed Feb. 11, 1974, Ser. No. 441,517

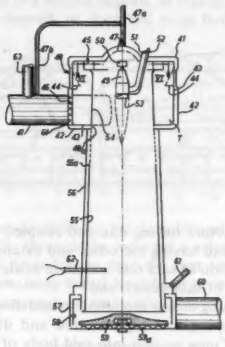
Claims priority, application France, Feb. 12, 1973, 73.04925

Int. Cl.² F01N *3/14;* F02B *75/10*

U.S. Cl. 60—286 **23 Claims**

1. An apparatus for after-burning combustible pollutants in the exhaust gases of an internal combustion engine, said apparatus comprising a reactor for burning the exhaust gases, means for introducing secondary air into the reactor, a toroidal body disposed upstream of said reactor for receiving the exhaust gases from the engine and imparting high rotational speed thereto before introduction of exhaust gases into said reactor, distributor means for introducing the exhaust gases into said reactor from said toroidal body with substantial suppression of the rotational momentum of the gases, a first obstacle serving as a flame holder mounted inside said toroidal body and having an annular face at which a first flame is produced, said reactor comprising a body having an inner surface which is approximately a surface of revolution around an axis, and a second obstacle disposed within said inner surface substantially along said axis and serving as a second

flame holder at which a second flame is produced with a surrounding gas recirculation zone, said second obstacle having a diameter between 15 and 40% of the diameter of the reactor to provide a contact time of 1 to 3×10^{-3} seconds of the gas flow in the said recirculation zone.



3,982,398

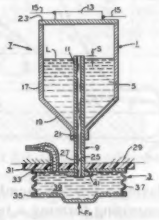
THERMAL ACTUATOR, METHOD OF CONTROLLING SUCH AND ACTUATING SYSTEM

Paige W. Thompson, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Jan. 15, 1974, Ser. No. 433,594

Int. Cl.² F03G *7/06*

U.S. Cl. 60—531 **30 Claims**



1. A thermal actuator comprising a pair of means for containing a vaporizable liquid, one of said containing means being generally filled with the liquid and the other of said containing means being filled only to a selected fill level therein with the liquid, means thermally associated with said other containing means and operable generally between an energized state for heating only the liquid in said other containing means to effect its vaporization and a de-energized state so as to permit cooling of the vapor in said other containing means thereby to respectively establish pressure differentials acting in opposite directions between said containing means, means communicated with said containing means for effecting the transfer of the liquid from said other containing means to said one containing means at one transfer rate and the return of the transferred liquid at another transfer rate different than the one transfer rate, said transfer effecting means including a portion within said other containing means having an opening predeterminately disposed at least generally coextensively with the selected fill level for passing only vapor created in said other containing means through said transfer effecting means to said one containing means in response to the establishment of the pressure differential acting in one of the opposite directions when said heating means is in its energized state and the vapor being condensed back to the liquid at least when subjected to the relatively cooler liquid in said one containing means, and the return of the liquid at the other transfer rate through said transfer effecting means being effected in response to the establishment of the pressure differential acting in the other of the opposite directions when said heating means is in its de-energized state.

3,982,399

FUEL DEGASSING METHOD

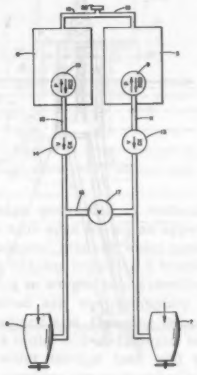
Earl T. Rookey, Long Beach, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Sept. 25, 1974, Ser. No. 509,238

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.² F01B *21/04, 25/00;* **F02C** *9/04*

U.S. Cl. 60—706 **4 Claims**



1. A method of operating a fuel system in an aircraft equipped with two or more fuel tanks, each tank having a reversible fuel booster pump submerged therein and connected to an engine fuel supply line, said tanks being vented to atmosphere, and means to selectively reverse the rotation of said fuel booster pumps, said method comprising reversing the rotation of the fuel booster pump in the unused fuel tanks when all engine fuel is being supplied from one tank only, whereby the reversed fuel booster pump agitates the fuel in said unused tanks to release entrained air and vapor from said fuel to escape from said tank vents.

3,982,400

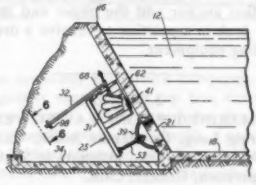
DISTRIBUTION VALVE FOR IRRIGATION CHANNELS

Donald E. Benkert, 999 E. Valley Blvd., Unit No. 50, Alhambra, Calif. 90032

Filed Nov. 24, 1975, Ser. No. 634,371

Int. Cl.² E02B *7/40*

U.S. Cl. 61—24 **11 Claims**



1. In a walled irrigation channel having ported side walls the combination comprising a frame, hinge means supporting the frame adjacent a port, a valving member on the frame adapted

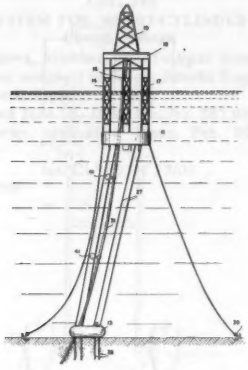
to seal the port, a fluid powered actuator supported adjacent the wall and bearing on the frame, means remote from the port for supplying fluid under pressure to the actuator, and means for adjusting the position of the valving member with respect to the frame, said hinge means having a pivot point substantially coincident with the plane of closure of the valving member at the port.

3,982,401

MARINE STRUCTURE WITH DETACHABLE ANCHOR

John T. Loggins, Metairie, La., assignor to Texaco Inc., New York, N.Y.

Filed Apr. 2, 1975, Ser. No. 564,522
Int. Cl.² B63B *35/44*
U.S. Cl. 61—93 7 Claims



1. Method for commencing directional drilling of an underwater well from a buoyant tension leg marine structure which includes; a buoyant base having a deck holding well drilling equipment thereon, a first anchor at the ocean floor having a registration passage therein, cable means under tension, connecting said marine structure to said first anchor whereby to partially overcome the buoyancy of said structure and to establish a vertical position defined by a substantially vertical relationship between said anchor and said marine structure and second anchor means depending from said deck connected to discrete anchors disposed at the ocean floor and positioned radially outward from said first anchor, which includes the steps of;

laterally displacing said buoyant structure from its neutral position to establish a predetermined angle of inclination thereof with said first anchor,

fixing said marine structure in said laterally displaced position,

fixing the lower end of an elongated drill string conductor to said first anchor and the upper end thereof to said working deck in a position to receive a drill string from said drilling equipment.

3,982,402

SUBMARINE PIPELINE LAYING VESSEL

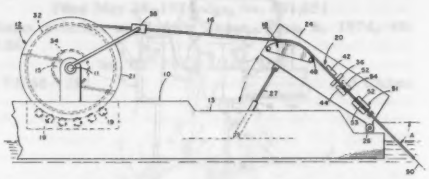
Alexander Craig Lang, Huntington Beach, Calif., and Peter Alan Lunde, Houston, Tex., assignors to Santa Fe International Corporation, Orange, Calif.

Filed May 5, 1975, Ser. No. 574,433
Int. Cl.² F16L *1/00*; B63B *35/04*; B65H *75/00*
U.S. Cl. 61—109 8 Claims

1. A vessel for continuously laying a pipeline on the bed underlying a body of water, comprising:

a pipe supply reel mounted for rotation on said vessel about its horizontal axis;

drive means for rotating said reel thereby unwinding a pipe section;



a diverter structure having one end coupled to one end of said vessel and having the other end extending upwardly in the direction of said reel and at an acute angle relative to the deck of said vessel; and

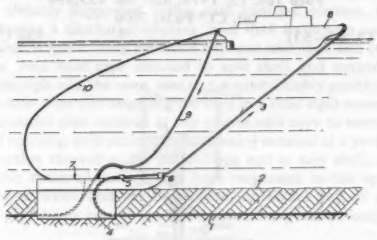
pipe-conditioning means mounted on said diverter structure for conditioning said pipe section and discharging the conditioned pipe section into said body of water.

3,982,403

LAYING CABLES AND THE LIKE UNDER WATER

Norman Howard Waterhouse, Windsor, England, assignor to BICC Limited, London, England

Filed Dec. 4, 1974, Ser. No. 529,565
Claims priority, application United Kingdom, Dec. 6, 1973, 56534/73
Int. Cl.² F16L *1/00*; E02F *5/02*
U.S. Cl. 61—72.4 10 Claims



1. A method of laying a flexible member below the bed of a body of water comprising forming a trench in the bed and laying it in a line having with respect to the flexible member at least one characteristic selected from a greater strength and another cost and burying the line; and then in a separate second operation after the line has been buried laying said flexible member from a cable-laying ship by a submerged plough caused to follow the path of said line and to re-form a trench on substantially the same route, lay the flexible member therein, and bury it.

3,982,404

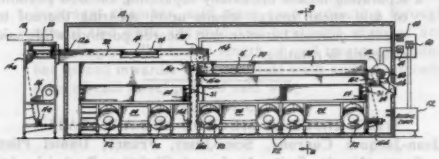
INDIVIDUAL QUICK-FREEZING OF MOIST ARTICLES USING DEEP FLUIDIZED BED AND INPUT CONDITIONER

Milan R. Overbye, Kent, Wash., assignor to Lewis Refrigeration Co., Woodinville, Wash.

Filed Nov. 4, 1974, Ser. No. 520,294
Int. Cl.² F25D *17/06*
U.S. Cl. 62—57 11 Claims

1. In I.Q.F. preservation of food and similar articles having surface moisture, the freezing process comprising first subjecting the articles amassed in a first deposit on a foraminous conveyor to flow of gas upwardly through the conveyor and such articles thereon at subfreezing temperature for a selected first time period which takes the articles predominantly to the incipient point of freezing where substantially all of the above-

freezing sensible heat is removed without removing the latent heat, with said deposit of articles being in a fluidized state during said first time period, and thereupon subjecting such articles massed in a second deposit, at least a few times deeper than the first deposit, to deep-bed mass fluidization freezing



created at least partially by gas at subfreezing temperatures flowed upwardly through the mass for a selected second time period several times longer than the first time period which removes all remaining latent heat from such articles and depresses their temperature materially below freezing throughout.

3,982,405

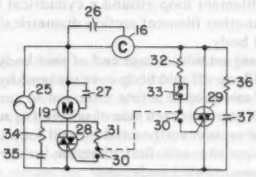
HAZARDOUS DUTY ROOM AIR CONDITIONER

Jack D. Seigler, 546 Beryl, San Antonio, Tex. 78213, and Gerald L. Rodgers, 14211 Turtle Rock, San Antonio, Tex. 78232

Division of Ser. No. 467,146, May 6, 1974, Pat. No. 3,911,693. This application July 23, 1975, Ser. No. 598,334

Int. Cl.² F25D *17/00*; **F25B** *49/00*

U.S. Cl. 62—181 **2 Claims**



1. A control circuit for an air conditioner for use in hostile environments, comprising:

a compressor motor having a first internal overload circuit;

a fan motor having a second internal overload circuit;

a pair of triacs each having a respective low current triggering means, one of said triacs being connected in circuit with said compressor motor and the other of said triacs being connected in circuit with said fan motor;

thermostat means for controlling the triggering means of said one triac to prevent operation of said compressor motor when room temperature is below a predetermined level;

manual double pole, double throw switch means for controlling the application of power to said air conditioner by simultaneously connecting said triggering means of both said triacs to a power source.

3,982,406

REFRIGERATOR WATER STORAGE AND DISPENSING SYSTEM WITH WATER FILTER

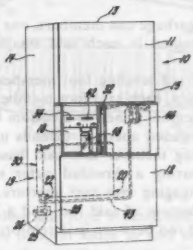
Robert S. Hanson, Kettering, and Louis D. Benasutti, Fairborn, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 28, 1975, Ser. No. 636,211

Int. Cl.² F25D *23/12*; **B67D** *5/62*

U.S. Cl. 62—339 **3 Claims**

1. In combination with a domestic refrigerator for dispensing chilled water; a refrigerator insulated cabinet having a chilled water dispensing service area accessible from the exterior of said cabinet, a cold water supply water storage tank in the fresh food storage compartment of said refrigerator having a notched upper corner adjacent one vertical edge of said tank, said tank having a lower inlet and an outlet in said notched upper corner, said tank having a serpetine storage volume comprising a plurality of substantially horizontally extending passes connecting said inlet and said outlet, the uppermost pass extending at a first upwardly inclined axis toward said outlet for purging air from said passes to said outlet, said outlet inclined at a second upwardly inclined axis equal to or greater than said first axis, said outlet terminating at a location recessed inwardly from said one vertical edge of said tank, wherein the improvement comprises an elongated



hollow filter cartridge positioned in vertically juxtaposed relation to said one tank edge having an upper inlet adaptor and a lower outlet adaptor, granular water conditioner in said cartridge, said inlet adaptor including a housing forming an upper chamber having an integral tube extending therefrom at a downwardly inclined axis complementary with the said second upwardly inclined axis, fastening means for sealingly connecting said tank outlet and said integral tube to form an assembly of said water storage tank and said cartridge, whereby said filter cartridge upper chamber is at the highest elevation of the water storage tank and cartridge assembly, and conduit means connecting said lower outlet adaptor with water dispenser means in the service area, whereby chilled water from said tank is purged of air and filtered just prior to being dispensed at the service area.

3,982,407

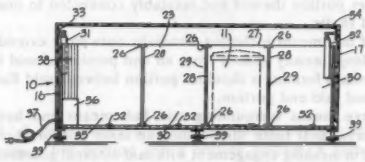
GARBAGE CONTAINER UNIT

Jean Guy Guenette, Toronto, Canada, assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Jan. 7, 1975, Ser. No. 539,120

Int. Cl.² F25D *11/00*

U.S. Cl. 62—441 **5 Claims**



1. A garbage container unit, which comprises:

a. a rectangularly shaped open top box having a bottom base with a plurality of drainage holes therein, a pair of upwardly extending vertical endwalls, a pair of upwardly extending vertical sidewalls, said base, said endwalls and said sidewalls defining a rectangularly shaped chamber therein;

b. a plurality of horizontally placed channel brackets affixed to an upper inside surface of said bottom base, said channel brackets additionally affixed to the top edges of said vertical sidewalls;

c. a plurality of vertically placed rectangularly shaped partition boards having air passageways therethrough, said partition board detachably mounted in said channel brackets for dividing said rectangularly shaped chamber into a plurality of smaller compartments, said smaller compartments varying in dimensions according to placement of said partition boards;

d. a cover hingably mounted onto one said sidewall of said box;

e. a cooling means contained in one said smaller compartment, said cooling means including an electric motor communicating a refrigerant unit, cool air from said refrigerant passing through said air passageways from one said smaller compartment to another said smaller compartment;

f. a plurality of garbage can members, one said garbage can member contained in each said smaller compartment; and

g. a plurality of self leveling foot members affixed to said base of said box, each said foot member including a flat reinforcing member joined to a bottom face of said base, wherein a threaded aperture extends upwardly through said reinforcing member into said base, a horizontally placed rod having a threaded outer surface, said rod threadably engaging into said aperture, a disc member affixed to a bottom of said rod, and a locking nut contained on said rod between said reinforcing member and said disc.

3,982,408

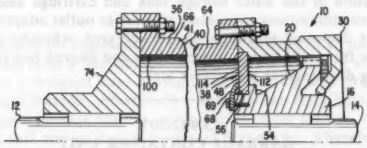
FLEXIBLE GEAR COUPLING HAVING A SHEAR SPACER AND SLEEVE CAPTURING MEANS

John Wright, Baltimore, Md., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed May 13, 1975, Ser. No. 577,060

Int. Cl.² F16D *3/18*

U.S. Cl. 64—9 R **4 Claims**



1. A flexible gear type coupling for connecting a pair of substantially coaxially aligned shafts to transmit torque therebetween, comprising:

a hub means having external gear teeth surrounding an outer portion thereof and rotatably connected to one of said shafts,

said hub means including a radially outwardly extending flange axially spaced from an end portion of said hub means forming a shoulder portion between said flange and said end portion;

a sleeve means surrounding said hub means and having internal gear teeth surrounding an inner portion thereof and in meshing engagement with said external gear teeth,

said sleeve means including a circumferentially extending recess around said inner portion of said sleeve means and in radial alignment with said shoulder portion;

a shear spacer means connected between said sleeve means and the other of said shafts for transmitting torque from said one shaft to said other shaft,

said shear spacer means being adapted to shear when excessive torque is applied thereto for protecting said coupling from damage by said excessive torque;

a capturing means interposed between said hub means and said sleeve means for maintaining said sleeve means substantially concentric about said hub means upon shearing of said shear spacer means,

said capturing means comprising an annular ring secured in said recess and extending radially inwardly therefrom and surrounding said shoulder portion in close proximity thereto for axial abuttment with said radially outwardly extending flange; and

a separating means for axially separating sheared portions of said shear spacer means upon shearing thereof to prevent contact between said sheared portions while said coupling is rotating.

3,982,409

WEFT-KNITTING METHOD AND APPARATUS

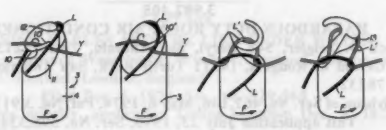
Jean-Jacques Conroux, Sciez-Jussy, France; Daniel Pilet, Borex (Vaud), Switzerland, and Christian Roehrich, Archamps, France, assignors to Battelle Memorial Institute, Carouge-Geneve, Switzerland

Filed Nov. 18, 1975, Ser. No. 633,105

Claims priority, application Switzerland, Nov. 19, 1974, 015357/74

Int. Cl.² D04B *35/00*

U.S. Cl. 66—1 R **8 Claims**



1. A knitting method comprising the steps of sequentially:

a. forming a filament loop around a cylindrical body,

b. disposing another filament section diametrically over the end of said body,

c. retaining said section at said end of said body,

d. sliding said loop off said body over said end by pulling on the legs of said loop in a first direction to surround said section of filament to each side of said end of said body,

e. pulling said section surrounded by said loop in a second direction opposite said first direction to form another such loop around said body, and

f. repeating steps (b) through (e) with the loop formed in step (e).

3,982,410

APPARATUS FOR THE CONTINUOUS TREATMENT OF AN ADVANCING WEB

Nelson F. Getchell, Great Falls, Va.; Norman R. S. Hollies, Bethesda, and Samuel S. Stanton, Chevy Chase, both of Md., assignors to Cotton Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 329,145, Feb. 2, 1973, Pat. No. 3,908,408. This application May 20, 1974, Ser. No. 471,692

Int. Cl.² D06B *3/10*

U.S. Cl. 68—5 E **5 Claims**

1. Apparatus for treating a continuously advancing web of material with a fluid comprising:

sleeve-like reaction chamber means having an entrance opening and exit opening;

a pair of partitions in said chamber means, one of said partitions being adjacent said entrance opening and the other of said partitions being adjacent said exit opening, said partitions having inlet and outlet openings aligned with said entrance and exit openings;

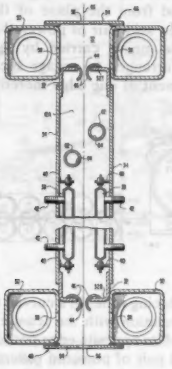
a pair of end walls and a pair of side walls interconnecting said partitions to define a fluid treatment chamber within said sleeve-like reaction chamber means for receiving a web of material traveling along a path from said inlet opening to said outlet opening;

each side wall having a dimension extending perpendicular to the direction of travel of said web and defining a length of said treatment chamber;

each end wall having a dimension extending perpendicular to the direction of travel of said web and defining a width of said treatment chamber;

said length having an extent which is multiple times the extent of said width;

a plurality of pipes for conducting pressurized fluid into said treatment chamber, said pipes each projecting through one of said walls and into said treatment chamber and extending parallel to the length of said treatment chamber spaced inwardly from said side walls and on opposite sides of said travel path of said web;



said pipes each including fluid discharge openings spaced therealong and being directed toward said travel path of said web so as to direct fluid toward a web traveling through said treatment chamber and to provide penetration of the fluid throughout the web during travel of the web through said treatment chamber; and evacuation means for withdrawing fluid from said treatment chamber between said entrance opening and said one partition and from between said exit opening and said other partition;

said evacuation means being arranged to allow material to enter and exit said sleeve-like chamber means without there occuring substantial leakage of gases from said sleeve-like chamber means.

3,982,411

WET TREATMENT DEVICE FOR DYEING TEXTILE MATERIAL IN THE FORM OF AN ENDLESS ROPE

Hans Kreitz, Stolberg, Rhineland, Germany, assignor to Firma H. Krantz, Aachen, Germany

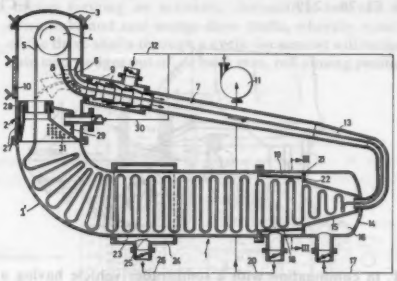
Filed May 30, 1975, Ser. No. 582,202

Claims priority, application Germany, June 26, 1974, 7421693

Int. Cl.² D06B *3/24, 3/28*

U.S. Cl. 68—177 **5 Claims**

1. A wet treatment device for dyeing textile materials in the form of a curved rope comprising a pressure tank having a horizontal storage portion including first and second ends, an upwardly curved portion at said first end, a vertical deflection portion rising from said upwardly curved portion, a driving tube having one end leading into said deflection portion and another end, said other end of said tube leading into said second end of said storage portion, said one end of said driving tube having a curved mouth portion, means for shifting said curved mouth portion through an angle of 180° between first and second positions, respectively, in which said curved portion faces directly upwardly and in which said curved portion faces directly downwardly, said rope extending through said storage portion, said deflection portion, and into said curved mouth portion of said driving tube, means to charge said storage portion with treatment liquid, a plurality of ring nozzles in said driving tube adjacent said curved mouth portion, means to charge said nozzles with treatment liquid under



pressure for feeding said rope in stretched condition through said driving tube to form loops in said storage portion and advance said rope through the treatment liquid in said storage portion into said deflection portion, and means providing access to said ring nozzles for replacement thereof.

3,982,412

YARN HANDLING PNEUMATIC DEVICE

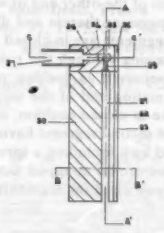
Bernard Isoard, Ecully, and Paul Juppet, Lyon, both of France, assignors to Rhone-Poulenc-Textile, Paris, France

Filed Dec. 9, 1974, Ser. No. 531,065

Claims priority, application France, Dec. 13, 1973, 73.44960; Oct. 1, 1974, 74.33252; Oct. 1, 1974, 74.33251

Int. Cl.² D06B *1/08;* **B65H** *17/32*

U.S. Cl. 68—200 **15 Claims**

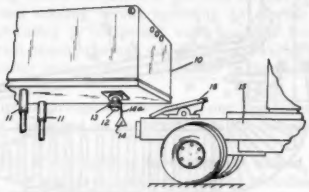


1. A pneumatic yarn-handling nozzle comprising a body having a top portion and a bottom portion, a yarn passage extending from the top portion to the bottom portion, a slot formed in the body and extending along a generating line of the yarn passage and providing communication between the yarn passage and the exterior of the body for substantially the whole length of the yarn passage, said slot having a chamfered outer portion extending along the length thereof, said nozzle having an upper part with a chamber therein, a fluid inlet into the chamber and at least two fluid outlet orifices communicating said chamber with the yarn passage in the body, and a further slot in the upper part permitting the passage of the yarn from the exterior into the yarn passage, the cross-section of the yarn passage increasing from the top portion toward the bottom portion.

3,982,413
KING PIN LOCK FOR SEMI-TRAILERS

Richard A. Stone, 7235 17th Ave. S., Minneapolis, Minn. 55423, and Mathias H. Riesgraf, 4945 Pennine Pass, Columbia Heights, Minn. 55421

Filed Mar. 17, 1975, Ser. No. 559,144
Int. Cl.² F16B *41/00*
U.S. Cl. 70—229 **1 Claim**



1. In combination with a semi-trailer vehicle having a depending king pin with a circumferential locking groove formed in the lower portion thereof;

a lock to obstruct and thus prevent connection of the trailer with the fifth wheel of a tractor, said lock comprising

a pair of generally semi-circular similar locking segments each having a pair of mating overlapping end portions of reduced thickness and forming a body of substantially the same width as the groove in the trailer king pin,

the inside diameter of each semi-circular segment being substantially equal to the diameter of the circumferential king pin groove to permit the segments to be received in locking position in the king pin groove and completely surround the same,

means for locking the two pairs of mating overlapped end portions of the two segments together in locking king pin position surrounding said king pin within the groove thereof to positively obstruct and prevent the king pin from entering the receiving slot of the fifth wheel of a tractor,

said locking means including pivotal means connecting the mating portions of one end of said locking segments,

the mating portions of the other end of said segment having lock receiving passages therein and disposed in registration when the segments are in closed locking position,

a lock element passing through the passage in one of the segments and received in locking position within the passage in the mating end of the second segment when the segments are in closed position, and

the passage of said second segment having a latch-receiving keyway and said lock including a spring latch element to permit the same to be snapped into locking position within said keyway when the segments are in closed position.

3,982,414
MACHINE FOR MAKING CORRUGATED FLEXIBLE CYLINDRICAL DUCT

Leroy E. Anderson, Detroit Lakes, Minn., assignor to Manufacturers Systems, Inc., Detroit Lakes, Minn.

Division of Ser. No. 410,234, Oct. 26, 1973, Pat. No. 3,876,321. This application Jan. 31, 1975, Ser. No. 545,814
Int. Cl.² B21C *37/12*
U.S. Cl. 72—50 **6 Claims**

1. Corrugated, flexible, cylindrical duct forming mechanism for producing such duct from an elongated strip of light-gauge aluminum, comprising:

a. a frame,

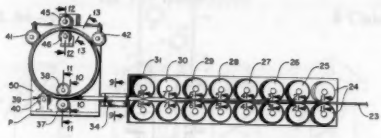
b. powered roller means carried by said frame for producing longitudinally extending corrugations in such a metal strip and forming oppositely extending side edge portions thereon as it passes therebetween,

c. fixed guide die means carried by said frame and positioned adjacent said roller means in metal strip-receiving relation thereto and being constructed and arranged to preform, for subsequent interlocking, such side edge portions of such a strip into seam elements as it passes therethrough,

d. a pair of powered rollers carried by said frame in fixed position adjacent said guide die means in position to receive therebetween such a metal strip after is passes therethrough,

e. a curvature-inducing roller carried by said frame and rotatably mounted adjacent said pair of powered rollers in position to engage such a metal strip shortly after it has passed therebetween and having a metal strip-engaging surface spaced from the plane of the metal strip as it passes between said pair of powered rollers,

f. forming guide means carried by said frame and constructed and arranged to engage such a strip and guide the seam element of one edge thereof after it passes said



curvature-inducing roller in a curved spiral path back into overlapping relation with the seam element adjacent the corrugation of its opposite edge portion at a point directly ahead of said pair of powered rollers,

g. said pair of powered rollers each having free end portions bearing cooperative seam-forming elements constructed and arranged to receive and engage therebetween such overlapping seam elements of such a strip and form then into an interlocking seam connecting the adjacent side edge portions of the adjacent convolutions of the strip and constituting one entire leg of a corrugation of the spiral duct so formed, and

h. a pair of powered finishing rolls carried by said frame and positioned at the opposite side of the so-formed spiral duct relative to said pair of powered rollers and constructed and arranged to receive and engage such a so-formed seam therebetween and to flatten and shape the same to extend radially of the so-formed spiral duct and parallel to the corresponding legs of the other corrugations of the metal strip.

3,982,415
FORMING METHOD AND MACHINE FOR SPLINING POWER TRANSMISSION MEMBERS

James Thomas Killop, Warren, Mich., assignor to Anderson-Cook, Inc., Fraser, Mich.

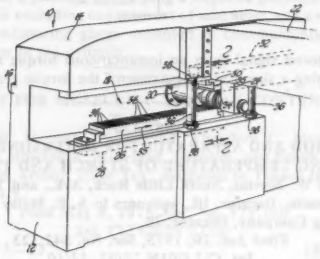
Continuation-in-part of Ser. No. 537,887, Jan. 2, 1975, abandoned. This application Aug. 21, 1975, Ser. No. 606,398
Int. Cl.² B21D *9/14, 53/28*
U.S. Cl. 72—88 **50 Claims**

1. A machine for forming splines in a thin-walled annular sleeve portion of a power transmission member having an annular end wall, the machine comprising the combination of:

a pair of elongated dies slidably mounted with respect to each other in a spaced and parallel relationship and movable between an end-to-end relationship and an overlapping relationship, each of said dies including teeth spaced along the length thereof:

an externally toothed pinion-type mandrel having an end for supporting the power transmission member by being received within the thin-walled sleeve portion thereof and engaged with the end wall thereof, the mandrel having a central axis about which the teeth thereof are generated; and

means mounting the mandrel between the dies for rotational movement about the central axis of the mandrel, the mounting means including means for engaging the end wall of the member in an opposed relationship to the end of the mandrel so as to cooperate therewith in securing the member on the mandrel, sliding movement of the dies from their end-to-end relationship to their overlapping relationship engaging the dies with the annular sleeve portion of the member supported on the mandrel to mesh the die teeth and the mandrel teeth with the annular sleeve portion of the member therebetween, and the meshing of the die teeth and mandrel teeth deforming the sleeve portion of the member radially with respect to the central axis of the mandrel to form the splines in a



rolling manner as the mandrel is rotated about its central axis on the mounting means.

49. A power transmission member comprising: an end wall of an annular shape extending about a central axis of the member; the end wall extending radially with respect to the axis and having a flat shape so as to permit mounting of the member for use; an annular sleeve portion extending axially from the end wall; said sleeve portion being formed with splines by a rolling process incorporating a toothed mandrel received within the sleeve portion and a pair of elongated racks having teeth along their lengths; the splines formed in the sleeve portion being relatively tough due to the minimal amount of work hardening resulting from the rolling process; and the end wall maintaining its flatness during the rolling process so the splined member may be mounted for use.

3,982,416

INDEXING WEDGE DRIVE FOR COLD TUBE REDUCING MILLS AND THE LIKE

Dezsoe Albert Pozsgay, Pittsburgh, and William R. Scheib, Sewickley, both of Pa., assignors to Aetna-Standard Engineering Company, Ellwood City, Pa.

Filed Nov. 19, 1975, Ser. No. 633,483
Int. Cl.² B21B 21/00
U.S. Cl. 72—214 **6 Claims**

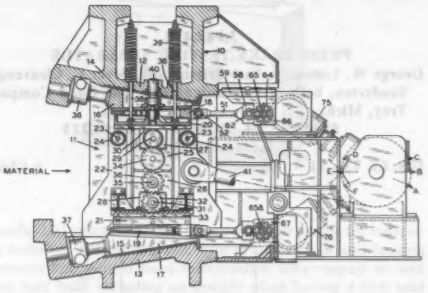
1. An indexing wedge drive for a cold tube reducing mill or the like, where the mill includes a mill housing forming an opening for receiving workpieces, a movable roll carriage mounted for limited reciprocating movement in said opening, in the direction of the workpiece pass line, carriage drive means including a main crank for reciprocating said carriage, grooved mill rolls in said carriage rotatable in conjunction with and as a function of the reciprocating movement of the carriage, backing plates for supporting said mill rolls, reciprocatable positioning wedges interposed between said backing plates and said mill housing and movable in a first direction to bring the mill rolls into operating positions and in a second direction to accommodate limited separation of the mill rolls, characterized particularly by the provision of improved means for effecting timed reciprocating movement of said wedges, which means comprises,

a. input drive shaft means connected to said carriage drive means and rotatable therewith,

b. an indexable wedge drive shaft associated with each of said wedges, supported by said housing and extending transversely of the workpiece pass line, one above and one below, adjacent the respective wedges,

c. drive links operatively associating each of said wedges with its respective indexable wedge drive shaft,

d. means forming an eccentric connection between said drive links and said wedge drive shafts, whereby rotation of the drive shafts through a cyclic increment will reciprocate said wedges out of, or back into, roll closing position,



e. index drive means connected to each of said indexable wedge drive shafts and driven by said input drive shaft means,

f. said index drive means being synchronized with said drive shaft means and main crank for indexing said wedge drive shafts through a cyclic increment as said main drive crank reaches the end of its stroke in each direction,

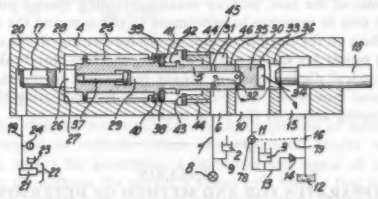
g. said index drive means holding said wedge drive shafts stationary throughout the principal portion of the operating strokes of said main drive crank.

3,982,417

DEVICE FOR CONTROLLING A MOVABLE MEMBER ON A MACHINE TOOL

Paul Cailloux, Val de Marne, France, assignor to Promecam Sisson-Lehmann, Saint-Denis, France

Filed Dec. 31, 1975, Ser. No. 645,882
Claims priority, application France, Jan. 20, 1975, 75.01596
Int. Cl.² B21J 9/12, 9/20
U.S. Cl. 72—453.01 **12 Claims**



1. In a machine tool comprising a driven member for performing an operation such as bending or shearing a sheet-metal workpiece, a hydraulic control system for controlling the movements of said driven member, at different speeds including at least one relatively fast speed for approach and one relatively low speed for working, and also for automatically stopping said member in an adjustable position at the end of its stroke, said hydraulic control system comprising a single distributor a slide valve provided in said distributor, actuating means associated with said slide valve and adapted to be

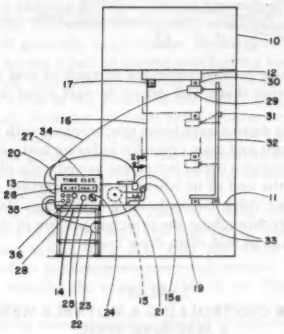
operated by the operator, a mechanical device adapted to actuate also said slide valve, a plurality of successive control members associated with said movable member to be driven, and adapted to actuate said mechanical device in order to produce different movements of said slide valve, and complementary passages provided in said distributor body and in said slide valve and being so arranged that the actuation of actuating means by the operator imparts the desired progressiveness to the fast motion of said driven member, the other successive actions exerted on said slide valve by said mechanical device controlling at least the change of speed and the stoppage of said driven member at the end of its stroke.

3,982,418

PRESS BRAKE TESTING APPARATUS

George W. Leavesley, New Britain, and Dever C. Cleavenger, Souderton, both of Pa., assignors to The Budd Company, Troy, Mich.

Filed Dec. 24, 1975, Ser. No. 644,223
Int. Cl.² G01P *3/36*
U.S. Cl. 73—11 **6 Claims**



1. Press brake testing apparatus, comprising in combination, a test unit, a connection from the test unit to replace the usual plug-in connection for press hand control, a flexible indicia strand connectible to the press ram, a take-up means for the flexible strand as the connected end follows the movements of the ram, pick-up means providing spaced pulses to the unit in response to movement of the ram and the spaced indicia on the flexible strand, means for cutting off the operating power for said ram and applying the ram-stop brake, and electrical digital read-out means responsive to the ram and strand movement and pick-up means for indicating the ram stopping action of the press brake.

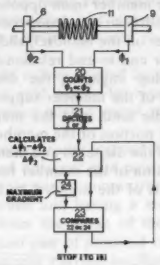
3,982,419

APPARATUS FOR AND METHOD OF DETERMINING ROTATIONAL AND LINEAR STIFFNESS

John T. Boys, Christ Church, New Zealand, assignor to Standard Pressed Steel Co., Jenkintown, Pa.

Continuation-in-part of Ser. No. 357,920, May 7, 1973, abandoned. This application Sept. 19, 1974, Ser. No. 507,417
Claims priority, application United Kingdom, May 9, 1972, 21480/72
Int. Cl.² B25B *23/14*
U.S. Cl. 73—139 **89 Claims**

77. Apparatus for determining torque gradient comprising means for developing a signal representative of the instantaneous torque applied to a rotary member, storage means for storing a series of signals representative of instantaneous torque and gradient register means for sequentially subtracting a stored signal from an instantaneous torque signal and developing a signal representative of the torque gradient.

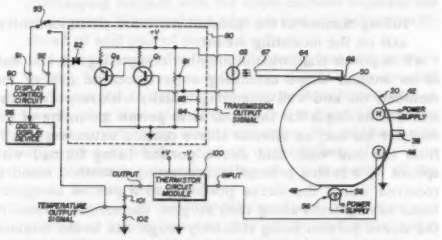


3,982,420

METHOD AND APPARATUS FOR DETERMINING THE PASTING TEMPERATURE OF STARCH AND THE LIKE

Charles W. Blevins, North Little Rock, Ark., and Thomas F. Protzman, Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Jan. 20, 1975, Ser. No. 542,323
Int. Cl.² G01N *25/02, 33/10*
U.S. Cl. 73—17 R **4 Claims**



1. The method of determining the pasting temperature of starch and the like, comprising the steps of mixing a predetermined quantity of starch sample into a predetermined quantity of water to form a starch slurry, heating said slurry, continuously monitoring the temperature of said slurry as it is heated, directing a light beam in a direction through said starch slurry while heating said slurry, detecting the light passed through said slurry by said light beam and creating a signal proportional to the amount of light detected, transmitting said signal to a display device and displaying the light transmissivity through said slurry on said display device, placing said display device in a hold condition when transmissivity of light through said slurry reaches a predetermined threshold representative of the pasting temperature of the starch, and causing said display device to display the temperature of said slurry during said hold condition when said predetermined light threshold is reached.

3,982,421

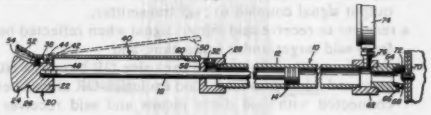
SEAL TESTER

Richard G. Wallace, R.D. No. 1- Box 16T, Blairstown, N.J. 07825

Filed Nov. 6, 1975, Ser. No. 629,512
Int. Cl.² G01M *3/26*
U.S. Cl. 73—40 **11 Claims**

1. A seal tester for screws, rivets, and like fasteners, said tester comprising an elongated hollow cylinder having first and second ends, an annular sealing head mounted on the first end of the cylinder and directly communicating with the inter-

ior thereof, said sealing head projecting forwardly of said first end for reception about and enclosure of the projecting end of a secured fastener, said sealing head being formed of a readily compressible resilient air impermeable material for conformance to and air excluding engagement with a surface



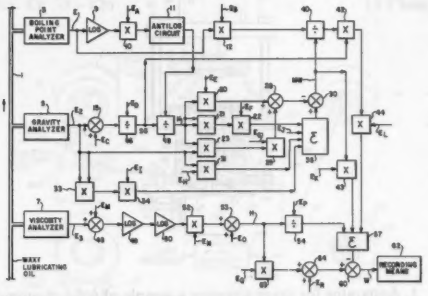
about and through which the fastener is secured, manual means operable through the second end of the cylinder and movable to a position developing a negative pressure therein upon an air excluding engagement of said head, and a negative pressure measuring gauge mounted in communication with the interior of the cylinder.

3,982,422

MEANS FOR MEASURING THE WAX CONTENT OF WAXY OIL

Charles W. Harrison, Nederland; Theodore C. Mead, Port Arthur; Howard R. Moreland, Houston, and Frank L. Barger, Port Arthur, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed May 8, 1975, Ser. No. 575,760
Int. Cl.² G01N *11/00*
U.S. Cl. 73—53 **18 Claims**



1. Means for measuring the wax content of waxy oil, comprising means for sensing a boiling point of the waxy oil and providing a corresponding signal, means for sensing the gravity of the waxy oil and providing a signal corresponding thereto, means for sensing the viscosity of the waxy oil and providing a signal representative thereof, and means connected to all the sensing means for providing a signal corresponding to the wax content of the waxy oil in accordance with the signals from the sensing means.

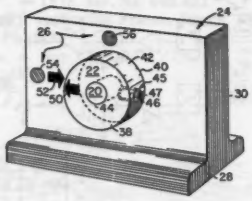
3,982,423

MUCUS TESTING PROCESSES AND DEVICES

Samuel R. Schuster, Wellesley, Mass., assignor to Ovutime, Inc., Wellesley, Mass.

Continuation-in-part of Ser. No. 462,298, April 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 433,767, Jan. 16, 1974, abandoned, which is a continuation-in-part of Ser. No. 300,187, Oct. 24, 1972, and a continuation-in-part of Ser. No. 472,611, May 23, 1974, which is a continuation-in-part of said Ser. No. 300,187.
This application Nov. 12, 1974, Ser. No. 523,047
Int. Cl.² G01N *33/16*
U.S. Cl. 73—54 **7 Claims**

1. A device for testing mucus from a bodily cavity, said device comprising a base, inner bearing means and outer bearing means composed of glass, said inner bearing means and said outer bearing means being arranged for motion with respect to each other on said base, means for biasing said inner bearing means and said outer bearing means for said motion, and means for indicating the occurrence of said motion, said inner bearing means and said outer bearing means have inner and outer cylindrical bearing surfaces, each of said bearing surfaces having a surface finish ranging from approximately 0.2 microns to 3.2 microns in valley to peak height, the clearance between said bearing surfaces ranging from approx-



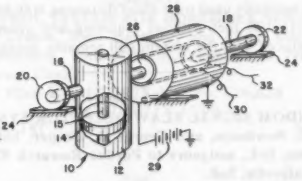
imately 0.25 microns to 254.0 microns, said means for indicating including indicia movable with at least one of said bearing elements and indicia fixed in operation with respect to said base, said base including an upright plate having a slot, said inner bearing member having a key, said key being removably retained by said slot, one of said indicia being located on said plate and the other of said indicia being located on said outer bearing member.

3,982,424

APPARATUS FOR MEASURING METACENTRIC HEIGHT OF A SHIP

Robert W. Peach, 888 Pine Trail, Arnold, Md. 21012

Filed Jan. 13, 1976, Ser. No. 648,637
Int. Cl.² B63B *9/08*
U.S. Cl. 73—65 **6 Claims**

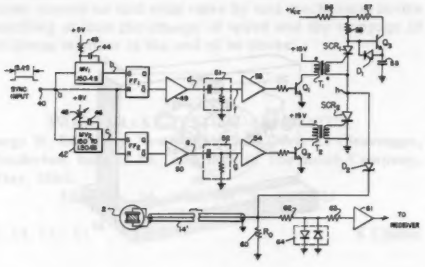


1. Ship stability measuring apparatus comprising an indicator arranged to indicate values of metacentric height, roll sensing means for generating a first electrical signal of one polarity throughout the period a vessel rolls from a first to a second extremity and a second electrical signal of opposite polarity throughout the period the vessel rolls from said second to said first extremity, electrical charge receiving means and means for charging said electrical charge receiving means in response to said first electrical signal, means for discharging said electrical charge receiving means in response to said second electrical signal, means for generating a signal in response to the discharging charge from said charge receiving means which is representative of the total period the vessel rolls from said first to said second and then to said first extremity, and means for connecting said last named means to said indicator to indicate the magnitude of said last mentioned signal in terms of metacentric height.

3,982,425
ULTRASONIC INSPECTION SYSTEM

Robert E. McLain, Woodland Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 14, 1974, Ser. No. 433,036
Int. Cl.² G01N 29/00
U.S. Cl. 73—67.8 S **13 Claims**



1. In an ultrasonic inspection system having means for remotely controlling the position of an ultrasonic transducer from a console that is situated at least about 100 feet away, said positioning means carrying only an ultrasonic transducer connected to said console by a transmission line of arbitrary length through which said console energizes said transducer with high-voltage pulses, and through which said console receives from said transducer low-voltage echo pulses, means at said console for transmitting an energizing pulse to said transducer through said transmission line, said pulse generating means being comprised of

a capacitor,

means for precharging said capacitor prior to generating each pulse,

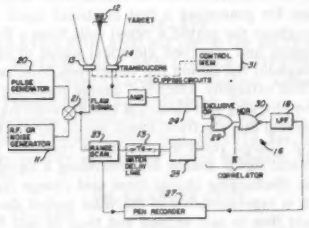
first timed switching means for discharging said capacitor into said transmission line at the time a drive pulse is to begin, and

second timed switching means for shunting discharge current from said capacitor away from said transmission line when a drive pulse is to terminate, whereby transmission lines normally used over short distances may be extended to over 100 feet without requiring any change at said transducer, and the system still remains operative.

3,982,426
RANDOM SIGNAL FLAW DETECTOR SYSTEM

Vernon L. Newhouse, and George R. Cooper, both of West Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Jan. 2, 1975, Ser. No. 538,190
Int. Cl.² G01N 29/04
U.S. Cl. 73—67.9 **11 Claims**



1. A flaw detection system, comprising:

a random noise source producing an output signal in the ultrasound frequency range;

a transmitter to transmit said output signal from said random noise source toward a target to be inspected for flaws;

delay means connected with said noise source to receive the output signal coupled to said transmitter;

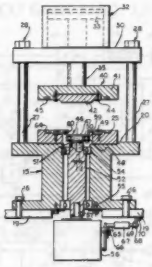
a receiver to receive said output signal when reflected back from said target under inspection; and

correlator means including an exclusive-OR circuit, a NOR gate, and a low pass filter, said exclusive-OR circuit being connected with said delay means and said receiver to receive the outputs therefrom, said correlator means responsive to receipt of outputs by said exclusive-OR circuit from said delay means and said receiver providing an output indicative of predetermined characteristics of a flaw in the target.

3,982,427
APPARATUS FOR WORKING AND TESTING SOLID ELASTOMERS

John M. Decker, 6809 Old Chesterbrook Road, McLean, Va. 22201

Filed June 6, 1975, Ser. No. 584,377
Int. Cl.² G01N 3/32
U.S. Cl. 73—101 **8 Claims**



1. Apparatus for shear stressing a sample of solid elastomer which sample has opposed faces lying generally in parallel planes substantially perpendicular to a central axis of the sample, said apparatus comprising, in combination, a frame, a first sample-engaging die mounted in said frame for holding one face of said sample having an axis adapted to be set parallel to said sample central axis, a second die also mounted to said frame for engaging the other face of said sample and having an axis also adapted to be set parallel to the central axis of the sample, said second die axis being aligned parallel with but not coincident with the axis of the first die, and drive means for gyrating the second die without rotation of said second die per se in a path of small radius around the axis of said first die.

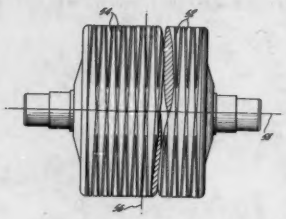
3,982,428
GROOVED WHEEL-CONTACT ROLLERS FOR VEHICLE TESTING APPARATUS

Jack A. Wilson, West Covina, Calif., assignor to Clayton Manufacturing Company, El Monte, Calif.

Filed Apr. 14, 1975, Ser. No. 567,993
Int. Cl.² G01L 5/28
U.S. Cl. 73—126 **19 Claims**

1. A vehicle test bed having a first roller for engaging the left vehicle wheel to rotate therewith by frictional peripheral contact, and a second roller for engaging the right vehicle wheel to rotate therewith by frictional peripheral contact, said first and second rollers each having at least one helical groove

in its wheel-engaging periphery to improve traction between the interengaging surfaces of the roller and wheel, the groove



in the first roller having an opposite angle of inclination from that of the groove in the second roller.

3,982,429

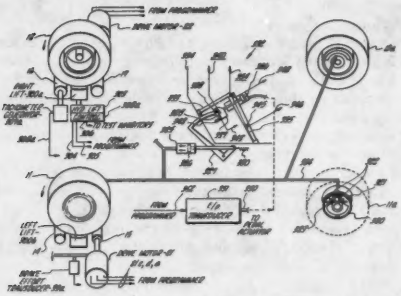
COMPUTER TYPE BRAKE ANALYZER

Edwin Lee Cline, Los Angeles County, Calif., assignor to Clayton Manufacturing Company, El Monte, Calif.

Continuation-in-part of Ser. No. 382,538, July 25, 1973, Pat. No. 3,899,916, which is a continuation-in-part of Ser. No. 811,168, March 27, 1969, abandoned. This application May 5, 1975, Ser. No. 574,283

Int. Cl.² G01L *5/28*

U.S. Cl. 73—126 **15 Claims**



1. In an apparatus for analyzing the braking performance of a wheeled vehicle having wheel brakes individually associated with at least two wheels, the combination which comprises:

test means for rotating said wheels of the vehicle for a test period during which the brakes are applied;

brake effort signal generating means including the test means for producing a separate brake effort signal for each wheel, each brake effort signal being proportional to the braking effort of the respective wheels while the wheel brakes are being applied;

brake effort imbalance generating means responsive to the brake effort signals for each wheel for producing a brake effort imbalance signal representative of the difference between the braking effort of the two wheels;

test level signal generating means responsive to the brake effort signals upon application of the wheel brakes for producing a test level signal when at least one of the brake effort signals reaches a signal representative of a pre-establisghed brake effort; and

output signal generating means responsive to the brake effort imbalance signal for producing an output signal having a time duration in excess of the test period when the braking effort imbalance exceeds a pre-determined acceptable percentage of brake effort imbalance.

3,982,430

PROCESS AND DEVICE FOR IMMOBILIZING A MOBILE COMPONENT OF A TIRE TESTING DEVICE RELATIVE TO A FIXED COMPONENT THEREOF

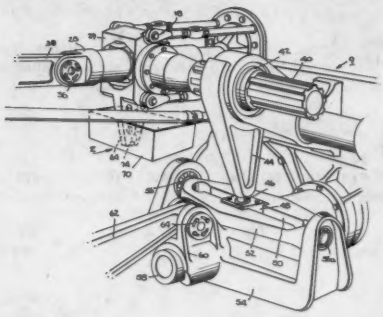
Olivier Pommellet, St.-Cloud, and Guy Drioton, Rueil-Malmaison, both of France, assignors to Regie Nationale des Usines Renault, Billancourt and Automobiles Peugeot, Paris, both of France

Continuation-in-part of Ser. No. 477,001, June 6, 1974, abandoned, and a continuation-in-part of Ser. No. 477,002, June 6, 1974, Pat. No. 3,937,076. This application Dec. 30, 1975, Ser. No. 645,452

Claims priority, application France, June 6, 1973, 73.20621, June 6, 1973, 73.21137

Int. Cl.² G01M *17/02*

U.S. Cl. 73—146 **10 Claims**



3. In combination, a tire testing device including a mobile component and an eutectic bath, said eutectic bath comprising a fixed receptacle, an eutectic alloy contained within said receptacle and temperature control means for heating and cooling said alloy, said mobile component extending into said bath such that when said eutectic alloy is cooled below its solidus/liquidus, said mobile component is locked with respect to said fixed receptacle.

3,982,431

CONTROL SYSTEM FOR BOREHOLE SENSOR

Donald S. Grosso, West Hartford, and Einar Asmundsson, Middle Haddam, both of Conn., assignors to Teleco Inc., Middletown, Conn.

Filed May 12, 1975, Ser. No. 576,628

Int. Cl.² E21B *47/00*

U.S. Cl. 73—151 **36 Claims**

20. The method of controlling a borehole sensor having a plurality of movable signal producing borehole parameter sensors and positioning means associated with each parameter sensor for positioning the parameter sensors for measuring parameters of a borehole, including the steps of:

operating each positioning means to position each parameter sensor in a first predetermined position;

generating a first stop signal to terminate the operation of each positioning means upon receipt of a position signal from the associated parameter sensor when the associated parameter sensor has reached its first predetermined position;

generating a first completion signal when all parameter sensors are at their first predetermined positions;

detecting signals from each parameter sensor and generating an output;

reoperating the positioning means to move each parameter sensor from its first position to a second position in response to the output from the associated parameter sensor and the occurrence of said completion signal;

determining when each parameter sensor has reached its second position and generating a second stop signal to terminate operation of the associated energizing means; and

measuring the movement of each parameter sensor from its first position to its second position and generating information commensurate with said movements.

3,982,432

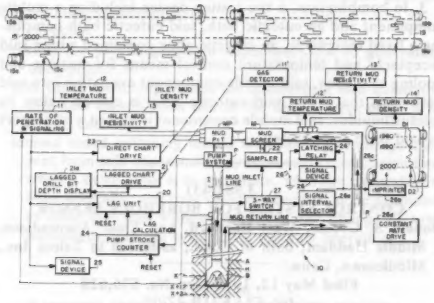
WELL MONITORING AND ANALYZING SYSTEM

William D. Hammond, Reforma 76-504, Mexico City, Mexico

Filed Jan. 15, 1975, Ser. No. 541,199

Int. Cl.[2] E21B *47/00*

U.S. Cl. 73—151.5 **25 Claims**



12. A system for monitoring a well bore being drilled with a drill string, drill bit and drilling fluid comprising:

a. output measuring and recording means for measuring and recording the output values of one or more parameters of said drilling fluid and/or matter included in a given sample of said drilling fluid after said fluid sample is ejected from said drill string and bit into the well bore and circulated to the well surface;

b. display means for forming a visual display representative of said output parameter values;

c. lag means responsive to the drill bit depth within the well bore and to the volume of fluid injected into the well bore for automatically relating the visual display of parameter values for a particular sample with the bore depth at which such sample was ejected from said drill string into the well bore; and

d. a strip chart recorder means included in said display means which is driven at a constant rate independent of the drill bit penetration rate.

3,982,433

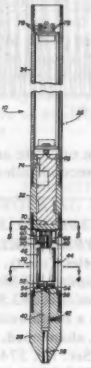
SPINNER TOOL FOR BOREHOLES

Beauford F. Stout, Grandview, Tex., assignor to Worthwell Surveys, Inc., Forth Worth, Tex.

Filed Dec. 5, 1974, Ser. No. 530,015

Int. Cl.[2] E21B *47/10*

U.S. Cl. 73—155 **15 Claims**



1. A spinner tool for detecting radially directed fluid flow in boreholes comprising:

an elongate, cylindrical housing;

a portion of the housing having a plurality of axially extending, angularly disposed slots formed therein at spaced apart points around the circumference of the housing;

an impeller rotatably supported in the housing and comprising a plurality of axially extending rigid blades positioned in alignment with the slots of the housing for actuation by fluid flow therethrough;

the blades having a substantially J-shaped cross-section and extending adjacent to the angularly disposed slots to resist radially directed fluid flow therethrough;

means responsive to rotation of the impeller under the action of fluid flowing through the slots in the housing for generating an output signal;

a shaft having the impeller mounted thereon;

the lower end of the shaft being rotatably supported on a ball which is in turn supported on the housing; and

the point of the shaft which engages the ball being exposed to the radially directed fluid flow through the angularly disposed slots to allow self-cleaning thereof.

3,982,434

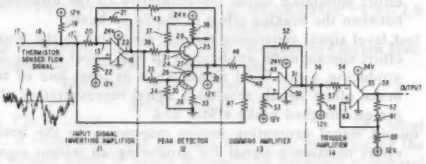
FLUID FLOW SIGNAL PROCESSING CIRCUIT

Charles Louis McMurtrie, North Plainfield, N.J., assignor to Eastech, Inc., Edison, N.J.

Filed Mar. 14, 1975, Ser. No. 558,280

Int. Cl.[2] G01F *1/32*; H03B *1/04*; H04B *15/00*

U.S. Cl. 73—194 VS **20 Claims**



10. A method for processing an input composite signal having at least a first signal and at least one other signal of a

lower frequency than said first signal and of an amplitude greater than amplitudes of said first signal and comprising

inverting the phase of said composite signal,

detecting peak amplitudes of said first signal in the inverted composite signal,

storing detected peak amplitude indicating signals in combination with said inverted composite signal, and

combining said input composite signal with the stored combination of said peak amplitude indicating signals of said inverted composite signal to produce an output signal of a frequency related to said first signal and of an amplitude greater than a said second signal component thereof.

3,982,435

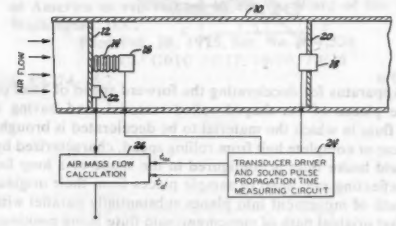
AIR MASS FLOW MEASURING APPARATUS

John L. Harned, Grosse Pointe Woods, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 18, 1975, Ser. No. 642,006

Int. Cl.² G01F *1/86, 1/66*

U.S. Cl. 73—194 M **3 Claims**



1. An apparatus for meaasuring the air mass flow through a passage comprising

a pair of sound pulse transducers disposed at upstream and downstream locations of the passage respectively,

means for varying the spacing between the sound pulse transducers as a function of air density,

a circuit coupled to the sound transducers for measuring upstream and downstream sound propagation times,

a temperature transducer mounted in the passage for measuring the air temperature,

and electrical means responsive to the upstream and downstream sound propagation time measurements and the temperature measurement for determining the air mass flow through the passage.

3,982,436

FLUID-VOLUME MEASURING APPARATUS

Eberhard Friebel, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

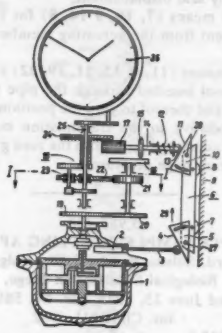
Filed June 12, 1975, Ser. No. 586,163

Claims priority, application Germany, June 28, 1974, 2431752

Int. Cl.² G01F *1/08*

U.S. Cl. 73—233 **12 Claims**

1. In a fluid-volume measuring apparatus equipped with a device for converting volume in dependence upon temperature, the device including: a summing gear arrangement having a controllable regulating transmission, and a motion transmitting arrangement for controlling the regulating transmission, the motion transmitting arrangement comprising: temperature sensitive actuation means for moving a plunger in response to changes in temperature of the fluid being measured; a movable carriage movable along a path transverse to the direction of movement of said plunger; said carriage having first cam means defining a control edge for receiving said plunger in engagement therewith whereby said carriage moves along said path in dependence upon the movement of said plunger; and, linkage means arranged transverse to said path for controlling the regulating transmission; said carriage having second cam means defining a control edge for acting on said linkage means in response to the movement of said carriage along said path, said control edges each having a contour selected with regard to the dependence of the temperature expansion coefficient of the fluid to be measured on the temperature of said fluid.



3,982,437

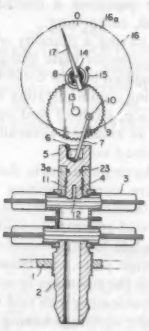
READILY ZEROED PRESSURE GAGE OF SPHYGMOMANOMETER

Shine Sekizawa, Fujisawa, Japan, assignor to Tokyo Iryoki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 28, 1976, Ser. No. 653,376

Int. Cl.² G01L *7/06*

U.S. Cl. 73—410 **5 Claims**



1. In a sphygmomanometer having a casing (1), an inflatable bag for detecting blood pressure, and a hose connected at its one end to the bag, the combination therewith of a pressure gage comprising:

a pipe fitting (2, 20) inserted through and fixed to a wall of the casing and connected at one outer end thereof to the other end of the hose;

an expansible, pressure-sensitive, metallic element (3) having a hollow interior and a central axis and connected at one axial end thereof coaxially and communicatively with the other inner end of the pipe fitting within the casing, the other axial end of the metallic element undergoing axial displacement in accordance with detected blood pressure transmitted through the hose as air pressure into the interior of the element;

an actuating member (5, 18) connected to said other axial end of the metallic element thereby to undergo axial displacement unitarily therewith;

a pressure indicating pointer (17) adapted to indicate the blood pressure on a calibrated scale (16*a*) upon being actuated by said displacement;

transmission means (7, 10, 9 14, 8) for transmitting said displacement from the actuating member to the pointer; and

adjustment means (11, 4, 12, 21, 19, 22) adjustably operable by a tool inserted through the pipe fitting from said one outer end thereof to vary the position of the actuating member relative to the transmission means thereby to move and adjust the pointer to the zero graduation on the scale for zero gage pressure.

3,982,438

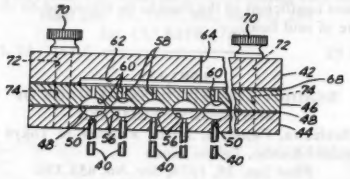
MULTIPLE SAMPLE PIPETTING APPARATUS

William J. Byrd, Solana Beach, Calif., assignor to The Salk Institute for Biological Studies, San Diego, Calif.

Filed June 23, 1975, Ser. No. 589,023

Int. Cl.[2] B01L *3/02*

U.S. Cl. 73—425.6 16 Claims



1. Apparatus for pipetting a plurality of predetermined quantities of a liquid, comprising:

a collector plate having a plurality of openings, the lower portion of the collector plate being adapted to receive a plurality of elongated hollow collector tubes in said openings, said opening communicating the lower surface with the upper surface, each of said openings in said upper surface having an enlarged generally smooth portion of a first predetermined volume;

a manifold plate having a recess in the lower surface thereof and an aperture communicating said recess with the opposite side thereof, said recess communicating fluid pressure from said aperture to said recess;

an intermediate plate located between said manifold plate and said collector plate and having openings generally coextensive with the openings in said collector plate, said openings communicating with said recess of said manifold plate, each of the openings having an enlarged generally smooth portion on the side adjacent said collector plate, each of said enlarged portions having a second predetermined volume;

a flexible impervious diaphragm positioned between said intermediate plate and said collector plate and adapted to be deflected upwardly or downwardly within each of said enlarged portions of said openings of said intermediate plate and collector plate, respectively, in response to selective application of fluid pressure thereto;

a plurality of elongated hollow collector tubes secured to the lower side of said collector plate within said openings;

means for connecting said manifold plate aperture to sources of positive and negative fluid pressure for deflecting said flexible diaphragm in opposite directions, respectively; and,

frame means for supporting said plates, said frame means being connected to at least one of said plates.

3,982,439

APPARATUS FOR SLOWING HEAD PIECES AND SAMPLES COMING FROM A ROLLING MILL

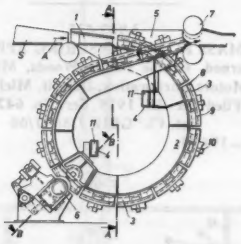
Erich Reth, Duisburg-Buchholz; Karl-Heinz Varwig, Mulheim, and Karl-Heinz Backhaus, Rheinhausen, all of Germany, assignors to Demag Aktiengesellschaft, Duisburg, Germany

Filed Aug. 22, 1975, Ser. No. 606,927

Claims priority, application Germany, Sept. 14, 1974, 2444014

Int. Cl.[2] G01N *1/04*

U.S. Cl. 73—423 R 6 Claims



1. Apparatus for decelerating the forward speed of head or sample pieces of bar-shaped rolled material, and having a brake flute in which the material to be decelerated is brought to a near or complete halt from rolling speed, characterized by

a. said brake flute is configured in the shape of a loop for deflecting said head or sample pieces from their original path of movement into planes substantially parallel with that original path of movement, said flute being positined substantially parallel to said path; and

b. means for moving said flute laterally into and out of said path.

3,982,440

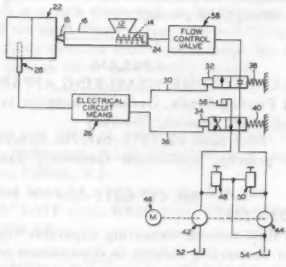
METHOD OF DETERMINING MOLDED PART PROFILE

Rodney J. Groleau, Plantsville, and Donald C. Paulson, Southington, both of Conn., assignors to Control Process, Incorporated, Plantsville, Conn.

Filed Aug. 13, 1975, Ser. No. 604,248

Int. Cl.[2] B29F *1/06*

U.S. Cl. 73—432 R 10 Claims



10. A method for determining the existence of material flow at a given location in the molding machine as a means of effecting a check of the quality of the part being molded therein comprising the steps of:

a. establishing a theoretical value for the level of the pressure that should exist at the given location under normal material flow conditions;

b. mounting a pressure sensor at the given location in the molding machine in the path of flow of the material;

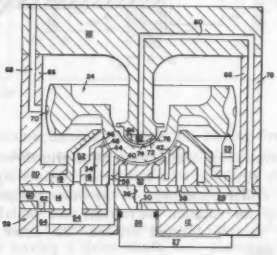
c. obtaining a sensing by means of the pressure sensor of the level of the pressure existing at the given location so as to establish an actual value for the pressure level thereat;
d. comparing the theoretical value for the level of the pressure at the given location with the actual value for the level of the pressure thereat so as to establish if the theoretical and actual values are the same within predetermined tolerances that normal material flow conditions prevail and if the theoretical and actual values differ by more than the predetermined tolerances that abnormal material flow conditions prevail; and
e. establishing an actual index for a part being molded in the molding machine through use of the information derived from said sensing if normal material flow conditions prevail and automatically indicating abnormal material flow conditions if such conditions prevail.

3,982,441

GYRO HAVING FLUIDIC BEARING WITH DUAL ORIFICES AND EXHAUSTS

Rayburn K. Widner, Arab, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 28, 1975, Ser. No. 554,336
Int. Cl.² G01C *19/12, 19/16, 19/26*
U.S. Cl. 74—5.7 **6 Claims**



1. A gyro comprising a stator housing, a rotor rotatably mounted in said stator housing by fluidic bearing means, said fluidic bearing means having a plurality of inwardly circumferentially arranged ports that have means for admitting fluid to said plurality of inwardly circumferentially arranged ports and said plurality of inwardly circumferentially arranged ports opening into a fluidic space defined between said rotor and said stator housing, a plurality of outwardly circumferentially arranged ports with means for directing fluid to said plurality of circumferentially arranged ports and said plurality of circumferentially arranged ports opening into the fluidic space defined between said rotor and said stator housing, a first circumferentially arranged exhaust from said fluidic bearing space and being located between said plurality of inwardly circumferentially arranged ports and said plurality of outwardly circumferentially arranged ports, a second circumferentially arranged exhaust located radially outwardly of said plurality of outwardly circumferentially arranged ports, and an exhaust channel between each of said plurality of inwardly circumferentially arranged ports and said plurality of outwardly circumferentially arranged ports and in fluid communication with said first exhaust and said second exhaust.

3,982,442

PRECISION SHAFT REGULATOR MECHANISM

John Shiurila, Pleasanton, Calif., assignor to The Singer Company, New York, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,940
Int. Cl.² F16H *35/18*
U.S. Cl. 74—10 R **10 Claims**

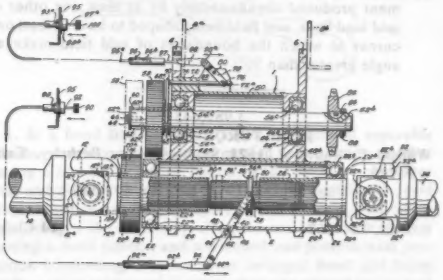
1. In a precision control mechanism for regulating the turning of a shaft, the combination comprising:
a. means on said shaft and operable to turn said shaft;
b. cam means concentric with said shaft and operatively connected to said first means, said cam means having control surfaces with lobes and recesses;
c. means to meter the amount of turning of said shaft, said metering means being driven by said means to turn said shaft.

3,982,443

POWER TAKE-OFF UNIT

Troy W. Fitch, Greenville, Tex., assignor to Eagle Custom Manufacturing Company, Greenville, Tex.

Filed Jan. 20, 1975, Ser. No. 542,092
Int. Cl.² F16H *37/00;* **F16D** *13/22*
U.S. Cl. 74—15.88 **3 Claims**



1. A power take-off unit adapted for mounting between the transmission and the drive shaft of a vehicle comprising: first and second hollow cylindrical housings; means securing said first housing to said second housing such that said first and second housings are parallel; a hollow internally splined drive shaft; a universal joint secured to one end of said drive shaft, a second end of said drive shaft extending into said first housing; a first bearing rotatably securing said drive shaft to said first housing; a drive gear secured to said drive shaft between said universal joint and said first housing; a hollow internally

splined driven shaft; a universal joint secured to one end of said driven shaft, a second end of said driven shaft extending into said first housing, the second end of said driven shaft being spaced from the second end of said drive shaft; a second bearing rotatably securing said driven shaft to said first housing, said first and second bearings being arranged to maintain said drive shaft and said driven shaft in axial alignment; an externally splined coupling shaft; means secured to said coupling shaft for moving said coupling shaft between a first position wherein opposite ends of said coupling shaft extend into the second ends of said drive shaft and said driven shaft and a second position wherein one end of said coupling shaft is spaced from the second end of said drive shaft; a power take-off shaft; means rotatably securing said power take-off shaft in said second hollow cylindrical housing such that opposite ends of said power take-off shaft extend outwardly of opposite ends of the second housing; a driven gear secured to a first end of said power take-off shaft; and means to move said driven gear between a first position engaging said drive gear and a second position disengaged from said drive gear.

3,982,444

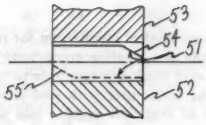
CONSTANT TOOTH-LOAD GEARING

William S. Rouverol, 52 Lovell Ave., Mill Valley, Calif. 94941

Filed May 30, 1975, Ser. No. 582,088

Int. Cl.² F16H *55/06*

U.S. Cl. 74—462 **20 Claims**



1. In a pair of mating gears,

teeth having working surfaces formed to contact on load lines,

the locus of said load lines as said gears rotate comprising a field of contact,

the boundaries of said working surfaces formed to provide a shape to said field that alters the length of each of said load lines as said gears rotate,

the change of moment of any of said load lines produced by said shape in response to a small rotation of said gears being balanced by an equal and opposite change of moment produced simultaneously by at least one other of said load lines, said field being shaped to have at least one corner at which the boundaries of said field make an angle greater than 90°.

3,982,445

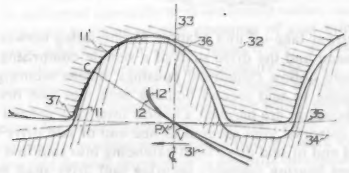
HIGH TORQUE GEARING

William S. Rouverol, 1521 Shattuck Ave., Berkeley, Calif. 94709

Filed Sept. 2, 1975, Ser. No. 609,360

Int. Cl.² F16H *55/06*

U.S. Cl. 74—462 **14 Claims**



1. In a pair of toothed gears,

mating teeth formed to have active profiles perpendicular to the pitch line of said pair which have at least one culmination point substantially removed from said pitch line,

said profiles of at least one of said pair having a variable-curvature portion with curvature that increases with distance from the pitch surface of said one of said pair,

one of said active profiles having a convex portion engaging a concave portion on the other of said active profiles,

said concave portion having a slightly larger radius of curvature at said culmination point than said convex portion,

the evolute of said variable-curvature portion being tangent to a line passing through said culmination point and the pitch point of said pair at a point adjacent to said pitch point.

3,982,446

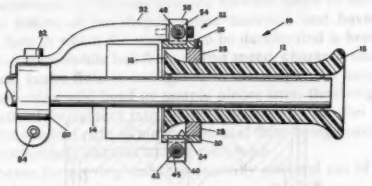
CRUISE CONTROL APPARATUS FOR HAND GRIP THROTTLE CONTROL

Andrew Van Dyken, P.O. Box 32, 2492 85th St., Byron Center, Mich. 49315

Filed May 30, 1975, Ser. No. 581,742

Int. Cl.² G05G *1/08;* **F16D** *49/10*

U.S. Cl. 74—488 **11 Claims**



1. Cruise control apparatus for a hand grip throttle mechanism rotatably mounted on a handlebar comprising:

an annular collar positioned on the outer periphery of the hand grip for rotation therewith, said collar having a gripping surface formed around the outer periphery thereof; and

holding means non-rotatably mounted on the handlebar for engaging and selectively holding the gripping surface and hand grip at any desired throttle setting, said holding means including non-rotatable retaining means encircling the handlebar in position for engagement with the gripping surface, the retaining means being movable between a released position, wherein the collar is freely rotatable with respect to the retaining means, and an actuated position, wherein the retaining means is clamped on the gripping surface so as to hold the hand grip at a given throttle setting, said holding means further comprising manual actuation means for selectively moving the retaining means between its released and actuated positions.

3,982,447

CONVOLUTED ROTOR STRUCTURES

David W. Rabenhorst, Clarksville, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Filed Sept. 2, 1975, Ser. No. 609,362

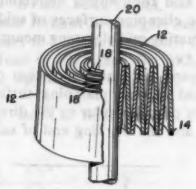
Int. Cl.² F16C *15/00*

U.S. Cl. 74—572 **10 Claims**

1. An inertial energy storage device for rotation about a shaft, comprising:

rim means carried on the shaft and comprised of a plurality of substantially concentric ring elements formed of essen-

tially anisotropic material having substantial tensile strength along longitudinal axes thereof; and,



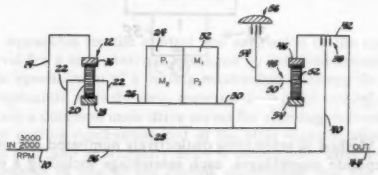
means for holding alternate adjacent edges of the concentric ring elements together.

3,982,448

INPUT-SPLIT HYDROMECHANICAL TRANSMISSION

James C. Polak, Indianapolis, and Phillip J. Ross, Brownsburg, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 27, 1975, Ser. No. 562,808
Int. Cl.² F16H 47/04
U.S. Cl. 74—687 **3 Claims**



1. A hydromechanical transmission, having first and second input-split drive ranges, comprising; input means; output means; variable ratio hydrostatic transmission means including first positive displacement pump-motor means having a drive shaft, and second positive displacement pump-motor means in fluid communication with said first-pump-motor means and having a drive shaft; first planetary gear means disposed in power flow relation between said input means and said first and second-pump motor means including a first member continuously connected to said input means, a second member continuously connected to said drive shaft of said first pump-motor means, and a third member continuously connected to said drive shaft of said second pump-motor means; selectively operable clutch means for selectively connecting said second member of said first planetary gear means and said output means; second planetary gear means including a first member continuously connected to said third member of said first planetary gear means, a second member continuously connected to said output means; and a third member; and means including selectively engageable friction drive establishing means for controlling the speed of said third member of said second planetary gear means, only said friction drive establishing means being engaged to established an input-split first drive range and only said clutch means being engaged to establish an input-split second drive range.

3,982,449

PORTABLE POWER OPERATED PIPE WRENCH

Frank J. Choate, Jr., 3465 Arbon St., Salem, Oreg. 97303

Filed Nov. 10, 1975, Ser. No. 630,656
Int. Cl.² B25B 17/00
U.S. Cl. 81—57.18 **8 Claims**

1. A portable power operated pipe wrench, comprising

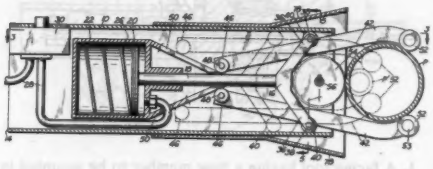
a. a tubular body housing having forward and rearward ends,

b. longitudinally movable yoke means slidably mounted in said housing in extending and retracting movements,

c. power means for driving said yoke means longitudinally,

d. a pair of opposed pipe engaging arms pivotally supported on said yoke means,

e. said arms having front pipe engaging ends arranged to engage a pipe in a closing pivoted positioning of said arms and to receive and release a pipe in an opening pivoted positioning,



f. a drive roller in said housing arranged to be brought into engagement with a pipe in the closing pivoted positioning of said arms,

g. guide means in said housing engageable by the rearward ends of said arms arranged to pivot said arms to their closing pivoted positioning in a retracted position of said yoke means and to pivot said arms to their opening pivoted positioning in an extended position of said yoke means,

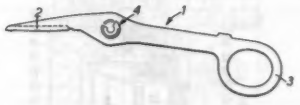
h. and drive receiving means in said housing connected with said drive roller arranged for driving connection with an outside power source.

3,982,450

PLASTIC FORCEPS HINGE

William Francis Marsh, Walmer, England, assignor to Haffenden-Richborough Limited, England

Filed Apr. 28, 1975, Ser. No. 571,944
Claims priority, application United Kingdom, May 20, 1974, 22378/74
Int. Cl.² B25B 7/06
U.S. Cl. 81—416 **4 Claims**

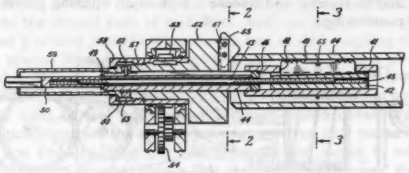


1. In a hand tool including a pair of identical separable members each comprising an elongated unitary body member having a jaw adjacent one end, a handle adjacent the other end, and pivot means intermediate said jaw and handle, said pivot means comprising a projection and a recess, said recess comprising a slot extending along the arc of a circle and including a main portion and a widened end portion, said projection comprising a base and an enlarged head and being positioned on said member on another part of said circle, said widened end portion of said slot being of a size to receive the enlarged head of a projection of a second member when said members are moved laterally towards each other in one relative angular position, said slot being of a size to receive the base portion of the projection of said second member and engage said enlarged head to retain said members against lateral separation when the two members are rotated from the said one angular position to a second normal working position in which said members are pivotally movable relative to each other.

3,982,451
FACING TOOL

Guy T. Gilmore, Crosby, Tex., assignor to Multi-Fab, Inc., Houston, Tex.

Division of Ser. No. 506,416, Sept. 16, 1974. This application Sept. 8, 1975, Ser. No. 611,355
Int. Cl.² B23B 3/22
U.S. Cl. 82—4 C 2 Claims

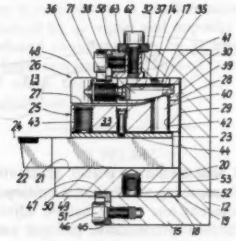


1. A facing tool having a base member to be mounted in a tube, a supporting column extending from said base member and anchored thereto by means of an axial shaft, a rotating column on said supporting column and a gear train extending from a source of power to said rotating column, a slip housing formed by said base member, and said supporting column and retractible slips mounted in said housing, a mandrel in said housing, bearing against said slips, and movable longitudinally to selectively extend and retract said slips laterally, said axial shaft extending through the supporting column and having a head on the extended end, adjacent said supporting column, and a handle secured to said supporting column, the longitudinal movement of said rotating member being effected by rotating said handle in a selected direction.

3,982,452
TOOL CLAMPING DEVICES

Helmut Scheiffele, Schwaikheim, Germany, assignor to Hahn & Kolb, Germany

Filed June 2, 1975, Ser. No. 582,894
Claims priority, application Germany, June 6, 1974, 2427413
Int. Cl.² B23B 29/00; B26D 1/00
U.S. Cl. 82—36 R 18 Claims



1. A tool clamping device, usable in a turning machine in conjunction with a tool, having a working end and a shank, and wherein a material to be worked is applied to the working end of said tool from a selected direction, comprising:

a support, adapted for mounting on said turning machine and including two rigid, parallel and mutually facing clamping surfaces;

at least one tool holder, adapted for insertion in said support, and having means for clamping said tool shank, a first clamping surface in said selected direction from said clamping means, and a second parallel and oppositely facing clamping surface, said tool shank clamping means for engaging said tool shank in a fixed position with respect to said second clamping surface, independent of insertion and clamping of said tool holder in said support;

spreading means on said tool holder, between said tool shank clamping means and said first clamping surface, for expanding said tool holder to clamp said tool holder between the clamping surfaces of said support;

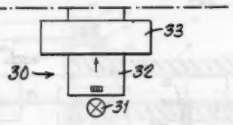
means for actuating said clamping means and said spreading means;

and guide means, for guiding motion of said tool holder between said support clamping surfaces in a direction substantially perpendicular to the direction between said tool shank and the working end of said tool.

3,982,453
METHOD OF ASSEMBLING NUMBERED DOCUMENTS IN ORDER

Salvatore F. D'Amato, Floral Park, and Francis T. Moss, Woodside, both of N.Y., assignors to American Bank Note Company, New York, N.Y.

Filed July 15, 1974, Ser. No. 488,448
Int. Cl.² B26D 7/06; B65B 63/00
U.S. Cl. 83—23 7 Claims



1. Method of assembling distinctively numbered documents in separate assemblages, each assemblage including a multiplicity of documents bearing all numbers within one of a multiplicity of consecutive sets, said documents being derived from a lot consisting of a multiplicity of stacks of multiple document sheets, in which lot the documents in corresponding locations of successive sheets are numbered in consecutive numerical order, the documents on each sheet are arranged by rows and columns and are numbered in a nonconsecutive numerical order in which successive members of the order bear numbers separated by a fixed difference, and the numbers on the first sheet in each stack follow consecutively the numbers on the last sheet in the preceding stack, comprising:

a. subdividing each stack into a plurality of arrays of individual documents, with only one document from one sheet in each array, the documents of each array being numbered consecutively;

b. transferring the arrays from each stack to one of a plurality of tributary conveyors in said nonconsecutive order so that the number on the first sheet in each array is separated from the number on the first sheet in the next array by said fixed difference; said tributary conveyors being equal in number to the number of stacks in a lot, so that the arrays in each group of corresponding positions on the tributary conveyors include documents bearing all numbers within one of said consecutive sets;

c. delivering simultaneously one array from one group of corresponding positions on all the tributary conveyors to consecutive locations along a main conveyor;

d. moving each group of simultaneously delivered arrays along the main conveyor to a locality beyond the tributary conveyors before repeating the delivering step (c);

e. repeating steps (c) and (d) until all the arrays from said groups of corresponding positions on the tributary conveyors are transferred to the main conveyor; and

f. removing each said group of arrays from the main conveyor as a consecutively numbered assemblage.

3,982,454

APPARATUS FOR THE CONTROL AND REGULATION OF CUTTING INTERVAL AND SYNCHRONISM AT A CUTTING MECHANISM FOR THE MACHINING OF STRIP MATERIAL

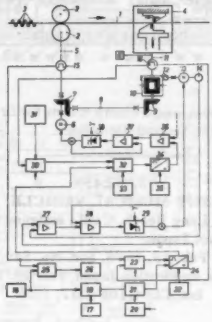
Franz Schneider, and Helmut Braitinger, both of Goppingen, Germany, assignors to L. Schuler GmbH, Germany

Filed June 4, 1975, Ser. No. 583,526

Claims priority, application Germany, June 11, 1974, 2428219

Int. Cl.² B26D 5/38

U.S. Cl. 83—74 18 Claims



1. Apparatus for the control and regulation of the cutting interval for a strip material advanced by roll feed means and of the synchronism of a cutting mechanism effecting the cutting operation with the strip material during the cutting step, wherein a common main drive serves for effecting movements of the cutting mechanism and of the strip material along its travel path and an auxiliary drive is additionally effective on movements of one of the cutting mechanism and the strip material by way of a superposed gear system, the apparatus comprising desired value pickup means for providing an output indicative of the cutting interval, at least one actual value pickup means for providing an output indicative of at least one of the length of the strip material traversed since the preceding cutting step and the travel velocity of the strip material and at least one of the stroke length and travel velocity of the cutting mechanism, comparison means responsive to the desired and actual value pickup means for comparing the actual values of at least one of the travel velocities of the strip material and the cutting mechanism and of the length of the strip material traversed since the preceding cutting step and the stroke length of the cutting mechanism with each other and with the desired value of the cutting interval, the comparison means being connected to control value pickup means for regulating at least the auxiliary drive until the cutting step is conducted.

3,982,455

DEVICE FOR SLITTING BILLETS

Raymond Earl Bowman, Oshawa, Canada, assignor to Co-Steel International Limited, Whitby, Canada

Filed Mar. 25, 1975, Ser. No. 561,776

Int. Cl.² B26D 1/22, 1/28, 7/06

U.S. Cl. 83—105 10 Claims

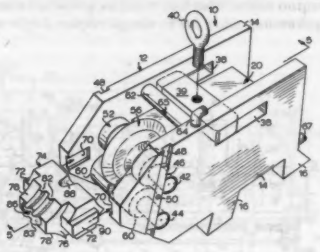
1. A device for slitting billets rolled to produce a multiple stranded bar, comprising:

a frame;

a guide member mounted on the frame and having a passage therethrough, the guide member being locatable between the rolls of a stand;

a circular knife rotatably mounted on the frame behind the guide member and having at least one blade peripherally bevelled to provide at least one pair of lateral shoulders;

means mounted on the frame below the knife to direct the strands against the shoulders of the knife blade whereby the strand is split in advance thereof;



means mounted on the frame behind the knife and having separate passages to receive and channel the individual strands split by the knife;

the guide member, the directional means, and the delivery means forming a linear path axially with the gap between the rolls of the stand.

3,982,456

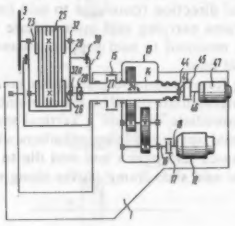
CIRCULAR SAW FOR CUTTING ROLLED PRODUCTS

Nikolai Ivanovich Krylov, 1 Novokuzminskaya 25, kv. 26; Boris Vasilievich Popov, Zelenodolskaya ulitsa 24, kv. 110, both of Moscow; Pavel Ivanovich Sidorov, Bykovskoe shosse, 26, kv. 124, Malakhovka 3, Moskovskoi oblasti, and Jury Efimovich Kim, ulitsa Malomoskovskaya 3, kv. 43, Moscow, all of U.S.S.R.

Filed Sept. 29, 1975, Ser. No. 617,707

Int. Cl.² B23D 45/04, 45/12, 47/12

U.S. Cl. 83—490 5 Claims



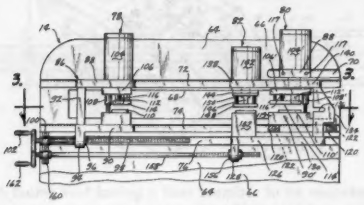
1. A circular saw for cutting rolled products, comprising: a housing; a carrier mounted on said housing; a hollow shaft of said carrier; an autonomous drive connected to said hollow shaft to bring said carrier into rotation; a casing secured dismountably on said carrier; a driven shaft arranged in said casing parallel to said hollow shaft of said carrier; a saw disk fixed on said driven shaft; a driving shaft built up of two parts interconnected by means of a detachable joint and mounted in said hollow shaft coaxially therewith; a means for connecting the parts of said driving shaft; one part of said driving shaft set up in said casing and linked mechanically with said driven shaft; a motor located on the housing; a shaft of said motor coupled with the other part of said driving shaft, said part of said driving shaft coupled with said shaft of said motor so that it has a possibility of displacing axially when these parts of said driving shaft are being detached.

3,982,457

NOTCHING MACHINE

Robert N. Berry, 4214 Newland, Cedar Falls, Iowa 50613

Filed Mar. 21, 1975, Ser. No. 560,776
Int. Cl.² B26D 5/12
U.S. Cl. 83—516 7 Claims



1. A notching machine comprising:
support means;
a pair of spaced apart end presses mounted on said support means,
an intermediate press mounted on said support means in a line with said end presses;
each of said presses including a punch and a die in vertical spaced registered alignment with one another, said punch being selectively vertically movable into said die,
said support means and said presses forming horizontal window when said punches are spaced from said dies, said window having a height defined by the spaces between said punches and said dies and having width at least as long as the distance between the outside edges of said punches and dies of said two end presses,
said window being free from obstruction so as to permit a sheet of metal to pass therethrough continuously in a horizontal direction transverse to said line;
a sliding frame carrying said intermediate press and being movably mounted to said support means for movement along said line;
said sliding frame comprising an upper member connected to said intermediate punch, a lower member connected to said intermediate die, and a vertical member interconnecting said upper and lower members whereby said slide frame causes said punch and said die to move in unison whenever said slide frame moves along said line.

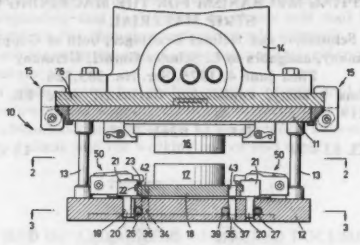
3,982,458

DIE SET

Tetsuichi Terasaka, No. 54, 1-chome Choeiji, Higashi-Osaka, Osaka, Japan

Filed Nov. 24, 1975, Ser. No. 634,839
Claims priority, application Japan, June 24, 1975, 50-89639[U]
Int. Cl.² B26F 1/06
U.S. Cl. 83—685 4 Claims

1. A die set comprising a first die holder movable towards and away from a second die holder spaced below said first die holder detachably fixed to a ram of a press machine by connector means, a first die detachably secured to said first die holder, a second die having a setting plate supported at both sides by means of opposed pairs of supports mounted on the second die holder so as to be movable up and down, plural positioning pins slidably inserted in said second die holder and fittable into holes provided in said setting plate, drive means for elevating and lowering the supports and the positioning pins in the simultaneous manner that the formers move re-



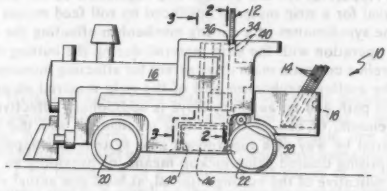
versely to the latters, and a clamp means for firmly holding the setting plate on the second die holder.

3,982,459

TOY MUSICAL VEHICLE

Kenzo Akiyama, Long Beach, Calif., assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Feb. 13, 1975, Ser. No. 549,526
Claims priority, application Japan, Feb. 25, 1974, 49-22108
Int. Cl.² G10F 1/12, 5/06
U.S. Cl. 84—83 9 Claims



1. A musical instrument having in combination a compressed gas source, a wind chest connected to said source, a plurality of sound producing means for use in producing sounds in response to a stream of compressed gas located adjacent to said wind chest, valve means for controlling the flow of gas from said wind chest to each of said sound producing means, and a rotary actuator for controlling the operation of said valve means, in which the improvement comprises:
said rotary actuator being located in a recess which is immobile with respect to the remainder of said instrument extending 180 degrees around the periphery of said actuator, said recess fitting with respect to said actuator in such a manner that said actuator is held by the confines of said recess so that it can be rotated and so that it cannot move in a axial direction as it is rotated,
each of said valve means including a movable body capable of being moved in controlling the flow of gas from said wind chest, each of said bodies including a cam follower, said body being located during the operation of said instrument so that said cam followers extend into said recess,
cam actuating means on said actuator for selectively moving said bodies so as to activate said valve means during rotation of said actuator, said actuator being located so that said cam actuating means will engage said cam followers during rotation of said actuator and
rotary drive means located so as to extend into said recess for engaging the periphery of said actuator in order to continuously rotate said actuator during the operation of said instrument, said actuator being held within said

recess by gravity so that there is engagement between the periphery of said actuator and said drive means.

3,982,460

MUSICAL-TONE-WAVEFORM FORMING APPARATUS FOR AN ELECTRONIC MUSICAL INSTRUMENT

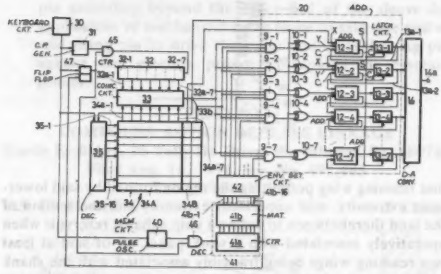
Nobuharu Obayashi; Hikaru Hashizume; Noriji Sakashita; Seiji Kameyama; Sadaaki Ezawa; Toshio Kugisawa; Yutaka Washiyama; Tatsunori Kondo, and Hironori Watanabe, all of Hamamatsu, Japan, assignors to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan

Filed Sept. 16, 1975, Ser. No. 613,931

Claims priority, application Japan, Sept. 17, 1974, 49-107401

Int. Cl.² G10F *1/00*

U.S. Cl. 84—1.03 **14 Claims**



1. Apparatus for forming a musical-tone waveform for an electronic musical instrument, at least one cycle of said musical-tone waveform being divided in amplitude by dividing lines spaced at equal intervals, sampling points on time axis being determined from respective crossing points between the waveform and the dividing lines, distance between initial and final of the sampling points being represented as a number of pulses such that each sampling point can be represented by a pulse number, said waveform at each sampling point having an increase, decrease or equal tendency, said apparatus comprising memory means wherein the pulse number of each sampling point is set up in the form of a digital signal and wherein additionally said tendency is set up in the form of a digital signal, envelope setting means wherein an envelope of said musical-tone waveform is subjected to sampling and the analog amount of each sampling point is set up in the form of a digital signal, and accumulatively adding means wherein an output digital signal of the envelope setting means is accumulatively added to or subtracted from an output digital signal of said memory means and a D-A converter means, said accumulatively adding means being connected at its output to said D-A converter means for converting output signals into analog signals.

3,982,461

MUSICAL-TONE SIGNAL FORMING APPARATUS FOR ELECTRONIC MUSICAL INSTRUMENT

Toshio Kugisawa, Hamamatsu, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan

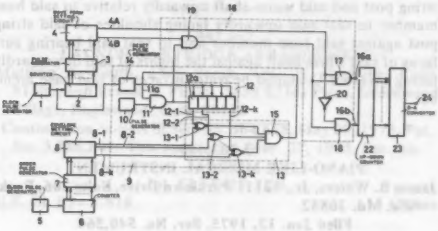
Filed June 5, 1975, Ser. No. 584,368

Claims priority, application Japan, June 6, 1974, 49-64381

Int. Cl.² G10F *1/00*

U.S. Cl. 84—1.03 **6 Claims**

1. A musical-tone signal forming apparatus for an electronic musical instrument comprising a musical-tone waveform setting means in which at least one cycle of a musical-tone waveform is subjected to sampling at n points and the amplitude thereof at each sampling point is compared with the amplitude at the preceding sampling point and an INCREASE, equal or DECREASE signal is generated as a digital signal to indicate the relationship determined, an envelope setting means in which an envelope of a musical tone is subjected to sampling at m points and the analogue amount at each sampling point is generated in order as a digital signal corresponding thereto, a pulse generating means whereby a pulse signal of which the pulse number corresponds to the digital signal value produced by the envelope setting means is repeatedly generated, a distribution means including addition and subtraction output terminals and in which output signals of the pulse generating means



are distributed either to said addition output terminal or said subtraction output terminal according to the digital signals of the musical-tone waveform setting means, an up-down counter means in which output signals of the addition output terminal and the subtraction output terminal are respectively added or subtracted, and a D-A converter means in which digital signals generated in order from the up-down counter means are converted into analogue signals.

3,982,462

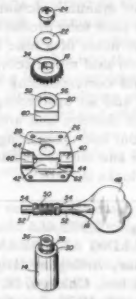
STRINGED INSTRUMENT MACHINE HEAD

Helmut F. K. Schaller, Kuckucksweg 16, 8501 Feucht, Germany

Filed Dec. 2, 1975, Ser. No. 637,105

Int. Cl.² G10D *3/14*

U.S. Cl. 84—306 **8 Claims**



3. A stringed instrument machine head comprising: a base member with a first opening passing vertically therethrough, a vertical string post journalled in and passing through said first opening of said base member for rotation relative thereto about a vertical axis, said string post having a lower portion extending downwardly from said base member and adapted to have a musical string attached thereto and wound thereon, said string post also having an upper portion extending upwardly from said base member and an upwardly facing radial shoulder adjacent the bottom surface of said base member, a worm gear fixed to said upper portion of said string post, a horizontal worm shaft with an axially extending worm, said worm shaft also having two axially extending bearing portions defining cylindrical bearing surfaces on opposite sides of said worm and a thumb turn at one end thereof, means on said base member defining two spaced downwardly facing inverted U-

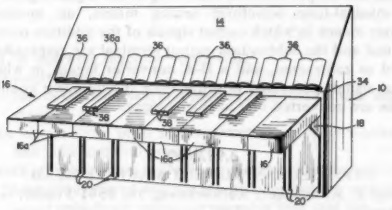
shaped bearing surfaces which respectively receive said two bearing portions of said worm shaft and rotatably support said worm in meshing relationship with said worm gear, and a leaf spring, said leaf spring having a first portion through which said post passes located between said base member and said worm gear and a second portion engaging the bottom of said worm, said leaf spring being of such undeflected shape as to be held in a deflected state between said base member and said worm and worm gear so as to resiliently urge both said string post and said worm shaft upwardly relative to said base member to seat said upwardly facing shoulder of said string post against said base member and to seat said bearing surfaces of said worm shaft against the bights of said downwardly facing inverted U-shaped bearing surfaces of said base member.

3,982,463

PIANO-LIKE MUSICAL INSTRUMENT

James B. Waters, Jr., 12111 Parklawn Drive, Suite 206, Rockville, Md. 20852

Filed Jan. 13, 1975, Ser. No. 540,564
Int. Cl.[2] G09B *15/02*
U.S. Cl. 84—476 **14 Claims**



1. A piano-like musical instrument arranged to be played by two or more people simultaneously, comprising: a plurality of tone producing blocks, such as several blocks comprising an octave, each tone block including a tone generator therein and means thereon for manually actuating said tone generator; a music score for each tone producing block, each music score including all the notes of a tune to be played thereon; visual coding means on said music score located only on the notes of the score and corresponding to the tone block assigned to that score; and an upstanding structure, said tone blocks being mounted thereon and arranged side by side in piano keyboard fashion, said upstanding structure including a generally vertical face and means on said face for individually attaching said tone blocks thereto.

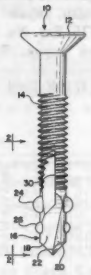
3,982,464

DRILLING AND REAMING

Henry Anton Sygnator, Arlington Heights, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Aug. 28, 1975, Ser. No. 608,427
Int. Cl.[2] F16B *25/00*
U.S. Cl. 85—47 **3 Claims**

1. A drilling and reaming screw including a threaded shank intermediate a driving head and a generally cylindrical drill point including a pair of flutes each terminating in radially extending cutting edges and formed in opposing quadrants of the cylindrical drill point between a pair of lands in opposing quadrants of the cylindrical drill point, a transverse dimension defined by the opposing land portions being substantially constant over an axial extent of the drill point and said transverse dimension being substantially equal to the radial dimension defined by the radially extending cutting edges, the flutes having an uppermost extremity and a lowermost extremity terminating at said cutting edge, at least two reaming wings each of a predetermined, limited, thickness, radial extent and longitudinal extent formed on the land portions of the drill point of the screw and at different axial locations thereon, the at least two reaming wings located intermediate the uppermost and lowermost extremities of the drilling flutes, a first of the two reaming wings located adjacent the cutting edge and being of a first radial dimension greater than the radial dimension of the cutting edge, a second of the two reaming wings located adjacent the uppermost extremity of the flute and being of a second radial dimension greater than the first radial dimension, the lowermost extremity of the second reaming wing being spaced axially from the uppermost extremity of the



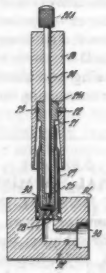
first reaming wing permitting the region formed by said lowermost extremity, said uppermost extremity and the section of the land therebetween to define a chip exhaust reservoir when operatively associated with a work panel, all of said at least two reaming wings being frangibly associated with the shank of the screw so that two or more juxtaposed work panels may be fastened by providing a clearance hole in a first of said work panels while minimizing the heat generated therefrom and separating the wings from the shank when they abut a second, harder, work panel.

3,982,465

CARTRIDGE CASE DECAPPING TOOL

Fritz M. Schabauer, 1309 N. Windsor Ave., Bayshore, N.Y. 11706

Continuation-in-part of Ser. No. 346,738, Feb. 4, 1973, abandoned. This application Nov. 13, 1974, Ser. No. 523,505
Int. Cl.[2] F42B *33/10*
U.S. Cl. 86—36 **10 Claims**



1. A decapping tool for removal of a spent primer from a cartridge case by means of an explosive charge, the cartridge case comprising a tubular member with an open end and a closed end, the latter end having a primer recess extending into its outer surface and flash hole means through the closed end from the recess to the interior of the cartridge case, the tool comprising:

A. a cylindrical sleeve for insertion into the inside of a cartridge case, said sleeve comprising:

1. a section having an external diameter slightly smaller than the open end of the cartridge case.
2. a squared-off end adapted to fit snugly against the inter surface of the closed end of the cartridge case around the flash hole means.
3. a cylindrical cavity extending axially into said squared-off end to receive an ejection primer and hold it immediately adjacent the inner surface of the closed end of the cartridge case, and
4. a longitudinal bore from the cavity to the other end of the sleeve;

B. a handle attached to said sleeve remote from said squared-off end to permit said squared-off end to be held firmly against the inner surface of the closed end; and

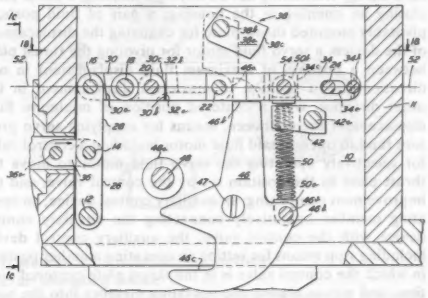
C. a firing pin slidably positioned in the bore, the length of the firing pin being greater than the length of the sleeve from the cavity to the other end thereof, one end of said pin extending beyond the other end of the sleeve for application of mechanical firing force to said one end of said firing pin to drive the other end of said firing pin against said ejection primer to explode the ejection primer.

3,982,466

COMPOUND ACTION RELEASE LINKAGE

Curtis K. Baker, 25 Tally Ho Drive, Warminster, Pa. 18974

Filed Aug. 14, 1974, Ser. No. 497,405
Int. Cl.² F41F 5/02
U.S. Cl. 89—1.5 G **5 Claims**



1. A release mechanism comprising:

a support means;

a releasable member pivotally connected to said support means for movement to and from a latched position;

a first link pivotally connected at its proximal end to said support means to thereby form a first spatially fixed axis of rotation;

a second link pivotally connected at its proximal end to the distal end of said first link;

a thrust link pivotally connected to said first and second links for simultaneously urging said first and second links to and from a toggle position;

a third link pivotally connected at its proximal end to the distal end of said second link, said third link having a shoulder at its distal end;

said third link additionally pivotally connected intermediate its ends to said support means to thereby define a second axis of rotation spatially fixed with respect to said first axis of rotation;

said first and second axes of rotation lying in a plane making an acute angle with a vertical plane;

a fourth link pivotally connected at its proximal end to the distal end of said third link, said fourth link having a shoulder at its proximal end;

a fifth link pivotally and slidably connected to said support means to thereby define a third axis of rotation coplanar with said second axis of rotation;

connective means for pivotally connecting said fourth link and said fifth link, said connective means including a surface for retaining said releasable member in said latched position; and

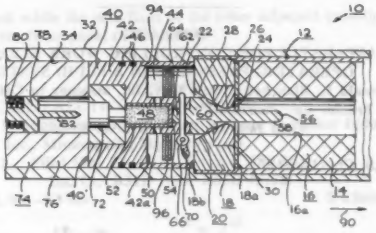
spring means pivotally connected to said releasable member and to said fifth link for urging said releasable member from said latched position, for urging said releasable member into abutment with said connective means surface, and for urging said third link shoulder and said fourth link shoulder into abutment.

3,982,467

LAUNCH CARTRIDGE ARRANGEMENT

Matthew S. Smith, 4400 Sarah, Apt. 29, Burbank, Calif. 91505, and Ernest A. Filippi, 5859 E. Ida Place, Greenwood Village, Englewood, Colo. 80110

Continuation-in-part of Ser. No. 364,658, May 29, 1973, Pat. No. 3,886,841. This application Mar. 27, 1975, Ser. No. 562,785
Int. Cl.² F41F 3/04
U.S. Cl. 89—1.818 **13 Claims**



11. In an improved launch cartridge for launching a rocket powered round from a spike type launcher wherein the rocket powered round has a tailpipe, a rocket propellent grain, a nozzle block and walls in said nozzle block defining a nozzle passageway therethrough communicating said tailpipe with said rocket propellent grain, and wherein the spike of the spike type launcher is insertable into the tailpipe of the rocket powered round, and the launch cartridge is of the type that is detachably insertable into the tailpipe of the rocket powered round intermediate the forward end of the spike of the spike type launcher and the aft end of the nozzle block of the rocket powered round, the improvement to the launch cartridge comprising, in combination:

a probe means;

coupling means for selectively detachable coupling of said probe means to said launch cartridge; and

means for driving said probe means into nozzle sealing engagement with said walls in said nozzle block for the condition of said probe means detached from said launch cartridge and when said rocket powered round is launched.

3,982,468

PISTON AND OBTURATOR ASSEMBLY FOR AUTOLOADING FIREARMS

Val A. Browning, Ogden, Utah, assignor to Browning Arms Company, Morgan, Utah

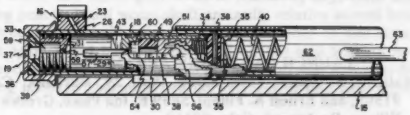
Filed Nov. 1, 1972, Ser. No. 302,655
Int. Cl.² F41D 5/10
U.S. Cl. 89—193 **17 Claims**

1. In an autoloading firearm of the type in which reloading is actuated by firing gases tapped from the barrel into a gas chamber attached to the magazine to drive a piston connected to a loading mechanism, the improvement comprising:

a cylindrical obturator slidably disposed in the gas chamber and arranged to be driven away from said piston by the tapped gases;

gas relief means opposite said obturator from said piston; and

valve means cooperative between said obturator and the piston to vent the gases from the gas chamber through said gas relief means when said obturator and the piston move apart; wherein



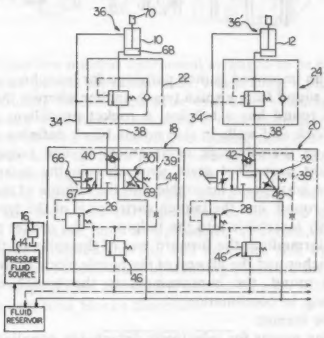
said obturator has a channel formed axially therethrough and said valve means includes a member which withdraws from said channel when said obturator is driven away from the piston to allow the firing gases to vent through said channel.

3,982,469

APPARATUS FOR CONTROLLING WORK ELEMENT OPERATING PRESSURES IN A FLUID SYSTEM

Donald L. Bianchetta, Coal City, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 23, 1976, Ser. No. 651,890
Int. Cl.² F15B *11/16*
U.S. Cl. 91—412 **5 Claims**



1. In a fluid system having a pressurized fluid source connected to at least one working element through a safety pressure relief valve constructed to open in response to a first preselected pressure, and a control valve assembly having a flow control valve positioned between a directional control valve and the pressurized fluid source, said directional control valve having a first conduit connected to one end of the work element for controllably passing fluid therebetween, the improvement comprising:

signal means in fluid communication with the first conduit for sensing the fluid pressure in said conduit and delivering said sensed pressure as a pressure signal to the flow control valve for controllably biasing said flow control valve toward an open position in response to said delivered pressure signal; and

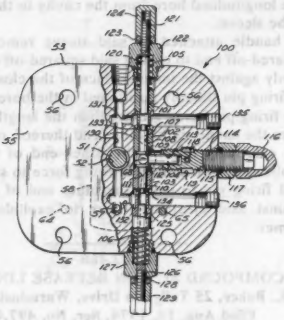
a signal pressure relief valve connected in fluid communication with the signal means for controllably passing fluid from the signal means for limiting the pressure on the working element to a second preselected value, said second preselected value being less than said first preselected value of said safety pressure relief valve.

3,982,470

CONTROL SYSTEM FOR AXIAL PISTON FLUID ENERGY TRANSLATING DEVICE

Cecil E. Adams, and Leo H. Dillon, both of Columbus, Ohio, assignors to Abex Corporation, New York, N.Y.

Filed Aug. 4, 1975, Ser. No. 601,554
Int. Cl.² F15B *13/14*; F01B *3/00, 13/04*
U.S. Cl. 91—506 **17 Claims**



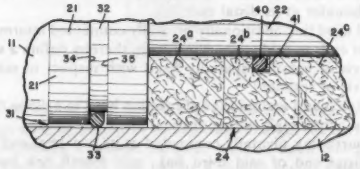
1. A control for an axial piston type variable displacement fluid energy translating device having a housing, a cover plate closing an opening in the housing, a pair of fluid ports, a pivotably mounted thrust plate for changing the displacement of the device, a servo fluid motor for pivoting the thrust plate between a position of maximum fluid displacement in one direction and a position of maximum displacement in the other direction with a centered position of minimum fluid displacement therebetween, means for supplying servo pressure fluid to operate said fluid motor including a control valve for selectively operating the servo fluid motor to move the thrust plate to the position set by the control valve, and the improvement comprising: an auxiliary control device, an operating member operatively connecting the auxiliary control device with the control valve, the auxiliary control device including stop means for setting an operating member position in which the control valve is in the thrust plate centered position, and means biasing the operating member into the position set by the stop member to cause the control valve to operate the servo fluid motor to move the thrust plate to the centered position.

3,982,471

SEAL IN PUMP PISTON INTERMITTENTLY PERMITTING CONDUCTION OF PUMP FLUID

John F. Finger, Beresford, S. Dak., assignor to Sioux Steam Cleaner Corporation, Beresford, S. Dak.

Filed Dec. 18, 1974, Ser. No. 533,979
Int. Cl.² F01M *1/04*; F16J *15/16*
U.S. Cl. 92—156 **1 Claim**



1. In a liquid pump comprising a cylinder having inlet and outlet passage means and a piston reciprocable in said cylinder, said piston having an enlarged head of smaller diameter than said cylinder, a stem of reduced diameter, a compressible packing carried by said stem, and means carried by said stem

for adjustably compressing said packing against said head for slidingly sealing engagement laterally with said cylinder, the improvement which comprises:

a. a peripheral groove around said head,

b. an annular member located in but only partially filling said groove, the width of said groove being greater than the thickness of said annular member and the difference between the inside diameter of said cylinder and the diameter of said piston at the bottom of said groove being greater than the difference between the inner and outer diameters of said annular member, and

c. means preventing passage of liquid along said stem beneath said packing.

3,982,472

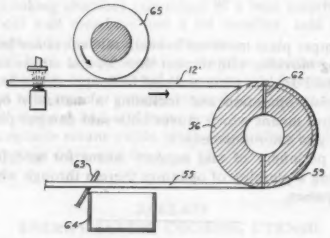
ENVELOPE MACHINE WITH WINDOW PATCH REMOVAL MECHANISM

George F. Howatt, Holden, Mass., assignor to New England Envelope Manufacturing Co., Worcester, Mass.

Division of Ser. No. 487,906, July 12, 1974, Pat. No. 3,869,965, which is a continuation of Ser. No. 335,725, Feb. 26, 1973, abandoned. This application Jan. 24, 1975, Ser. No. 543,676

Int. Cl.² B31B *1/12, 1/82*

U.S. Cl. 93—61 A **1 Claim**



1. An envelope machine, comprising:

a. an elongated frame,

b. a conveyor mounted in the frame for carrying longitudinally of the frame envelope blanks having window openings,

c. a window applicator mounted on the frame above the conveyor and spaced upstream a substantial distance from the discharge end of the conveyor, the window applicator dropping a window patch toward the conveyor irrespective of whether an envelope blank is present or not,

d. a roller forming a part of the conveyor at the discharge end and having suction passages, and

e. means operative when an envelope blank is missing to apply suction to the roller to carry a window patch around the roller to the underside of the conveyor.

3,982,473

ENVELOPE-MAKING METHOD

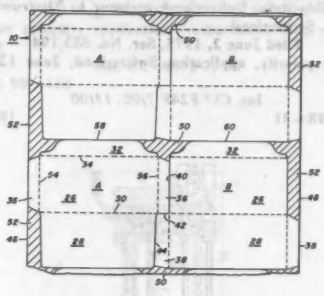
John Roberts, IV, East Liverpool, Ohio, assignor to American Paper Products Company, Youngstown, Ohio

Filed June 26, 1975, Ser. No. 590,581

Int. Cl.² B31B *1/16*

U.S. Cl. 93—63 M **4 Claims**

1. A method for making envelopes from a continuous web of paper such that the cut blanks can move essentially continuously from one or more cutting stations to envelope-gumming and folding stations, which comprises passing said continuous web through at least one rotating die roll and a backup anvil roll to sever from the web at least two envelope blanks in side-by-side relationship with the sealing flaps of the envelope blanks extending in the same direction and with the side flaps of one adjacent envelope being on the back panel of



the blank while the side flaps of the other adjacent envelope are on the front panel of the blank.

3,982,474

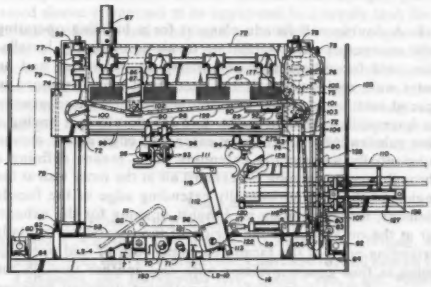
CASE ERECTING AND FORMING MACHINE

Robert N. Klund, Stillwater, Minn., assignor to Delkor Industries, Inc., Minneapolis, Minn.

Filed May 23, 1975, Ser. No. 580,365

Int. Cl.² B31B *1/80*; B65B *43/30*

U.S. Cl. 93—53 SD **8 Claims**



1. Apparatus for opening rectangular knockeddown cases comprising:

a pair of opposed movably mounted frames;

frame moving means for controllably moving said frames toward and away from each other to form a case opening area between said frames;

rotary means carried by said frames for engaging opposite sides of a case as it is received between said frames and for progressing such a case between said frames in a direction transverse to the direction of relative movement of said frames;

means mounted on said frames for maintaining said rotary means in engagement with such a case while it is disposed between said frame;

means for altering the direction of rotation of at least one of said rotary means carried by one of said frames (and constructed and arranged) to open such a case between said frames as they are moved away from each other by said frame moving means;

control means connected with said frame moving means for arresting the opening movement of said frames when such a case has reached an open position and for closing the same after the case has been removed therefrom; and

means for moving such a case away from said case opening area after the case has been so opened.

3,982,475

DOUBLE-WALL FACADE ELEMENT FOR BUILDINGS HAVING AN OVERPRESSURE VENTILATING OR AIR CONDITIONING INSTALLATION

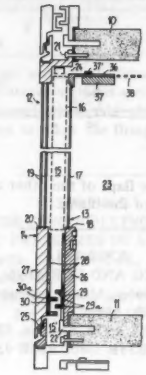
Ernst Wild, Stafa, Switzerland, assignor to Electrowatt AG, Zurich, Switzerland

Filed June 2, 1975, Ser. No. 583,194

Claims priority, application Switzerland, June 12, 1974, 8021/74

Int. Cl.[2] F24F 7/00, 13/00

U.S. Cl. 98—31 18 Claims



1. A double-wall facade element for a building operating with an overpressure ventilating or air conditioning installation, said facade element comprising an inner wall and an outer wall, said inner wall and outer wall being arranged in spaced relationship from one another to form therebetween an intermediate compartment, said facade element having a first substantially horizontally extending edge and a second substantially horizontally extending edge, means defining a throughpassage opening for exhaust air at the inner wall at the region of the first horizontally extending edge of the facade element, means defining an exhaust opening for the exhaust air at the outer wall at the region of the second horizontally extending edge of the facade element, both of said openings being in flow communication with one another through the agency of the intermediate compartment disposed between the inner wall and outer wall, said throughpassage opening possessing a flow cross-section which is greater than the flow cross-section of the exhaust opening but smaller than the flow cross-section of the intermediate compartment, check valve means arranged at the region of the exhaust opening and responsive to external pressure increases in order to throttle the flow cross-section of the exhaust opening, so that there is adjusted a pressure gradient in the intermediate compartment between the throughpassage opening and the exhaust opening, said pressure gradient being smaller than the difference between the partial pressure of the water vapor internally of the building and the partial pressure of the water vapor at the outside of the building with an external temperature which is lower in contrast to the temperature internally of the building.

3,982,476

COOKING APPARATUS

Jack S. McLane, Atlanta, Ga.

Filed Oct. 12, 1971, Ser. No. 187,972

Int. Cl. A47j 37/07

U.S. Cl. 99—339 4 Claims

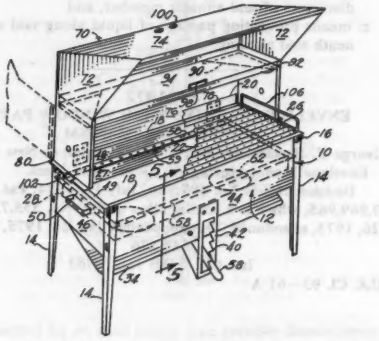
1. In a cooking device:

a. a container body supported on ground engaging members at respective corners thereof and said container body having damper openings in the bottom thereof and controlled ventilation therethrough,

b. a foraminous, corrugated food platform supported on said container body above said bottom

c. a movable fuel support pan movably supported on said body beneath said food platform and above said openings in the body,

d. support means for said fuel pan extending through said bottom of said container,



e. a damper plate mounted beneath said container body and being movable with respect thereto, and means connecting said damper plate and said fuel support pan for simultaneous operation and including a manually operated control means which moves both said damper plate and said pan simultaneously.

f. the periphery of said support means for said fuel pan having a plurality of openings therein through which the air passes.

3,982,477

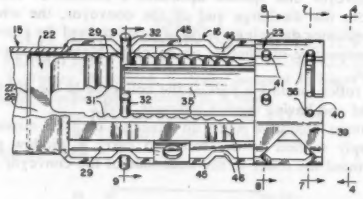
MOLD WITH PLUG TAKE-UP MECHANISM

Daniel L. Orloff, and Charles H. Johnson, both of Madison, Wis., assignors to Oscar Mayer & Co. Inc., Madison, Wis.

Filed Mar. 11, 1975, Ser. No. 557,300

Int. Cl.[2] A47j 27/20

U.S. Cl. 99—351 13 Claims



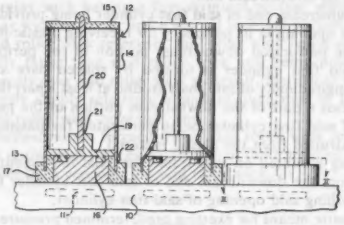
1. A tubular loaf mold adapted for receiving a stuffable food material to be processed for continuously producing a loaf food product comprising: an elongated hollow body open at both ends, means on one end for receiving a cover for closing said one end, a plug positionable and movable within said body, and a take-up mechanism at the end of the body opposite said one end coacting with the plug to accommodate expansion and contraction of the food material during processing thereof, said take-up mechanism including means connected to the mold and coacting with said plug for retarding movement of said plug in both directions, wherein a predetermined force against the plug is necessary to move same in the mold.

3,982,478

FOOD PREPARATION AND STORAGE DEVICE

Edward T. Szewczyk, 2578 Royal View Drive, Allison Park, Pa. 15101

Filed Nov. 3, 1975, Ser. No. 627,896
Int. Cl.² A47J 37/04
U.S. Cl. 99—419 6 Claims



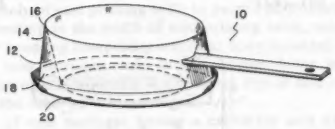
1. A device for preparing and storing food comprising:
a. an element base member having a thermally conductive heating element therein,
b. a cooking chamber comprised of a base member, cylindrical wall members and a lid member, said members adapted to form a closed chamber,
c. said base of said cooking chamber member having a conductive core adapted to engage said heating element and heat transfer means adapted to conduct heat from said element and said base; and
d. receptacle means within said cooking chamber to receive drippings from said food.

3,982,479

ENERGY SAVING COOKING UTENSIL

Jacob W. Sova, 450 Victory Way, Wyckoff, N.J. 07481

Filed May 2, 1975, Ser. No. 574,114
Int. Cl.² A47J 27/00
U.S. Cl. 99—447 3 Claims



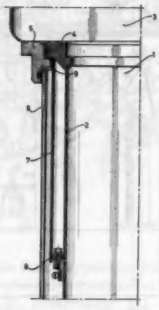
1. An energy saving cooking utensil comprising:
an inner member having the shape and dimensions of a standard stove-top cooking utensil including a base, side perimeter walls and an upper perimeter rim;
an outer flange extending outwardly and downwardly from the upper perimeter rim of said inner member and integrally formed with said upper perimeter rim;
said outer flange having a base rim which extends beyond the circumferential perimeters of said inner member and of a heating unit of a stove;
said outer flange and said side perimeter walls defining a heat circulation passage about the perimeter of said inner member;
a plurality of spaced apart apertures along the top of said upper perimeter rim to permit drainage during washing;

3,982,480

COLUMN FOR DRAINING A WHEY-CURD MIXTURE

Gerrit George Kamphuis, Gorredijk, Netherlands, assignor to Stork Amsterdam B.V., Amstelveen, Netherlands

Filed Aug. 25, 1975, Ser. No. 607,818
Claims priority, application Netherlands, Aug. 27, 1974, 7411421
Int. Cl.² A01J 25/11
U.S. Cl. 99—456 4 Claims



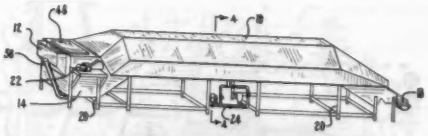
1. Whey-curd draining column to be used in a cheese-producing machine, which column consists of an upright, perforated sleeve connected at its upper end to a supply tank for a mixture of curd and whey and at its lower end cooperating with a discharge member for the curd, a jacket arranged around the upper part of the perforated sleeve, said jacket encircling the sleeve at its lower end via a sealing member, and forming an annular space around the sleeve and having such a length that at its lowermost point the absolute liquid pressure is not higher than the absolute pressure within the sleeve.

3,982,481

FOOD PROCESSING APPARATUS

Edward T. Console, 39 Gonzales St.; Anthony G. Wilson, 48 Eaton Ave., both of Watsonville, Calif. 95076, and Joseph G. Lamandri, 205 Harkleroad Ave., Santa Cruz, Calif. 95060

Filed Aug. 18, 1972, Ser. No. 281,974
Int. Cl.² A47J 27/58
U.S. Cl. 99—477 5 Claims



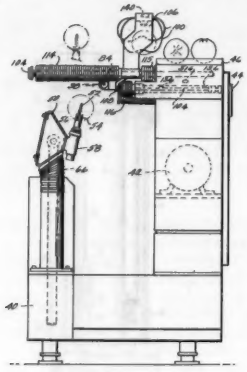
1. Apparatus for food processing with steam comprising:
a steam chamber,
a conveyor through said chamber for food transport,
a plurality of steam emission nozzles communicating with said chamber and directed at said conveyor,
a steam supply connected to said nozzles, and steam return means above said conveyor for collecting steam and being connected to said nozzles and communicating with said chamber for recirculating steam in said chamber, said nozzles comprising venturis for mixing steam from said steam supply and said steam return means.

3,982,482

FRUIT PEELING APPARATUS

John D. Webb, Clearwater, and Alan F. Houghton, Dunedin, both of Fla., assignors to Webb's Machine Design, Clearwater, Fla.

Filed Nov. 22, 1974, Ser. No. 526,331
Int. Cl.² A23N 7/00
U.S. Cl. 99—491 63 Claims



37. Apparatus for peeling fruit having a peel and an edible interior portion comprising:

means for inserting a conductive member into said interior portion,

means for cutting into the fruit to a variable depth,

means for detecting the electrical impedence of the fruit between the point of cutting and said conductive member and producing an electrical control signal as a function thereof and

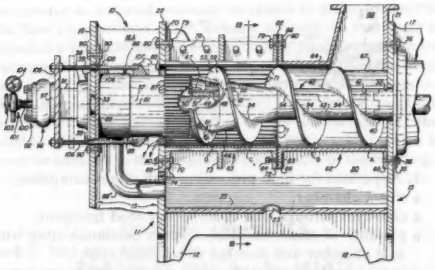
means for controling the depth of cutting as a function of said control signal.

3,982,483

MOISTURE REDUCTION PRESS

Thomas C. Bird, Scottsdale, Ariz., and Walter J. Paetzold, Hereford, Tex., assignors to Corral Industries, Inc., Phoenix, Ariz.

Filed Apr. 25, 1975, Ser. No. 571,569
Int. Cl.² B30B 9/18
U.S. Cl. 100—117 3 Claims



1. A press for extracting liquid from plastic material comprising:

a frame,

a shaft at least a part of the periphery being in the form of a truncated cone rotatably mounted on said frame and having a worm section of positive pitch formed along at least a part of its outer periphery,

the truncated cone of said shaft tapering from its apex near the upstream end of said shaft toward the downstream end thereof,

a first cylinder mounted on said frame and surrounding the worm section of said shaft,

said first cylinder being closed at its upstream end and open at its downstream end,

the upstream end of said first cylinder being provided with an opening in its periphery for receiving plastic material, the perforated downstream portion of the periphery of said first cylinder is formed by spaced bars arranged longitudinally of said shaft around at least a part thereof

at least a part of the downstream portion of the periphery of said first cylinder being perforated for passing liquid extruded from the plastic material,

a ring mounted on said frame for axial movement to and from the downstream end of said first cylinder for controlling said opening of said first cylinder,

pressure means for exerting predetermined pressure on said ring for biasing said ring toward the periphery of said partial opening, said pressure means comprising an inflatable means adaptable for receiving fluid under pressure of predetermined values,

a second perforated cylinder mounted on said frame in axial alignment with the downstream end of said shaft and protruding through an aperture in said ring into abutting aligned contact with the periphery of the cone of said shaft whereby the plastic material extruded by said worm section of said shaft moves over the outer periphery of said second cylinder, the perforations of said second cylinder are formed by spaced bars arranged longitudinally of said shaft around at least a part thereof

said second cylinder passing therethrough liquid pressed from said extruded material by said ring, and

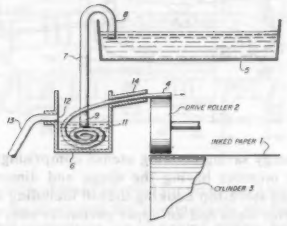
detachably mounted wear shoes mounted on the downstream side of the last flight of said worm section at the downstream end of said shaft.

3,982,484

ROLLER MOISTENING WICK SYSTEM FOR PREVENTING DRIPPING WITHIN A DUPLICATING MACHINE

Thomas M. Madigan, Pittsford, N.Y., assignor to Itek Corporation, Lexington, Mass.

Filed Jan. 3, 1975, Ser. No. 538,487
Int. Cl.² B41F 7/38, 23/02
U.S. Cl. 101—422 2 Claims



1. In a duplicating machine, an improved wick system for preventing ink build-up on a paper drive roller which transports said paper within said duplicating machine, said system comprising:

a. a roller wick reservoir for containing fluid therein;

b. a roller wick having one end thereof positioned within said roller wick reservoir and having an opposite end contacting said drive roller;

c. a sleeve member positioned between said roller wick reservoir and said drive roller for surrounding and sup-

porting said roller wick to orient said roller wick in an upward direction with respect to said roller wick reservoir, and for preventing dripping of water within said roller wick into lower portions of said duplicating machine;

d. a relay wick reservoir having a substantially greater fluid capacity than said roller wick reservoir for containing large quantities of fluid to be supplied to said roller wick reservoir over greatly extended time periods;

e. a relay wick having a first terminal portion within said relay wick reservoir and a second terminal portion within said roller wick reservoir, said relay wick being substantially fatter than said roller wick and being positioned directly over said roller wick reservoir, thereby to continuously supply relatively abundant quantities of fluid to said roller wick reservoir; and

f. overflow means formed within said roller wick reservoir for draining any excess quantities of fluid supplied to said roller wick reservoir by said relay wick.

3,982,485

WASHING MACHINES FOR PRINTING OR PROCESSING TABLES

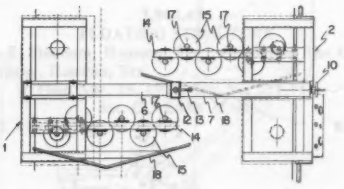
Salvador Gali Mallofre, Londres 29-1°,2ª, Barcelona, Spain

Filed June 24, 1975, Ser. No. 589,834

Claims priority, application Spain, Nov. 20, 1974, 432.130

Int. Cl.² B41F *35/00*; B41L *41/00*

U.S. Cl. 101—425 **1 Claim**



1. A washing machine for printing or processing tables, the washing machine comprising:

an arrangement of two complementary carriages, each of said carriages adapted to be mounted for movement on laterally extending rails mounted on opposite sides of a printing table to be cleaned;

means for adjustably coupling said carriages together transversely of said printing table to permit adjustment corresponding to the width of said printing table, said means for coupling comprising a tubular body mounted on each of said carriages, said tubular bodies being joined in telescopic relationship for coupling one of said carriages to the other of said carriages;

each of said carriages having a cantilever arm extending across more than half the width of said printing table, each of said arms supporting a plurality of circular brushes, a gear on each of said brushes for receiving a driving force from an adjacent one of said brushes or from a drive means, said brushes being mounted along each of said arms in a zig-zag arrangement;

each of said brushes being carried by pneumatic pistons for movement of the brushes to and from the surface of the table, the path of travel of said piston being longer than the distance which separates the brushes from the table, a valve for regulating pressure applied by said brushes; and

said tubular bodies being provided with a spindle and a fixed nut capable of adjustment in either direction relative to the width of the table, and a handwheel connected by means of the spindle to the fixed nut for adjustment of the relative position between said telescoping tubular bodies and, therefore, the width between the carriages.

3,982,486

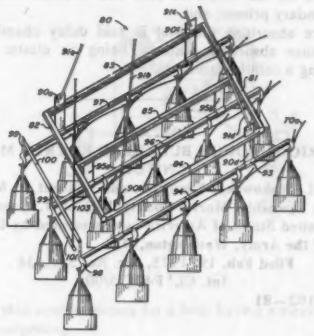
NON-EXPENDABLE POSITIONING FRAME FOR MULTIPLE EXPLOSIVE CHARGES

Robert E. Eckels, 2101 Youngfield, Golden, Colo. 80401

Filed Jan. 14, 1975, Ser. No. 540,952

Int. Cl.² F42B *3/02*

U.S. Cl. 102—24 HC **10 Claims**



1. Non-expendable frame apparatus for the remote, simultaneous placing of a plurality of explosive charges at predetermined space intervals, comprising:

a. open frame means of sufficient strength to support a plurality of individual, separate explosive charges laterally spaced from each other and suspended therefrom;

b. means for suspending said open frame means in a generally horizontal position from at least one overhead haul rope;

c. releasable holding means depending downwardly from said open frame means at predetermined spacing for individually holding each one of a plurality of explosive charges; and

d. release means interconnected with said releasable holding means for simultaneously releasing all of the explosive charges in their predetermined position.

3,982,487

MICRO-DELAYED DETONATOR FOR BALLISTIC ROCKETS AND ROCKETS THUS EQUIPPED

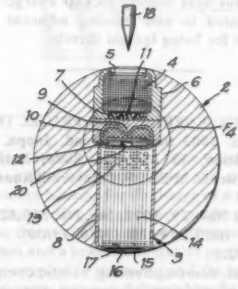
Adelin F. Richelle, Agimont, Belgium, and Hans D. Harnau, Koblenz, Germany, assignors to S.A. Prb. Societe Anonyme, Brussells, Belgium

Filed June 4, 1974, Ser. No. 476,206

Claims priority, application Belgium, June 14, 1973, 800881

Int. Cl.² F42C *1/00*

U.S. Cl. 102—70 R **1 Claim**



1. A delay train for a rocket, comprising:

a body having a continuous bore therethrough;

a first housing in said bore enclosing a primary primer;

striking means to fire said primary primer upon impact of said rocket;

a second housing in said bore enclosing a secondary primer seated on a support therein and having a wall closing said bore between said first housing and secondary primer, said wall defining with said first housing a closed delay chamber therebetween;

an anvil on the inside of said wall directed toward said secondary primer; and

pressure absorbing material in said delay chamber, said pressure absorbing material being an elastic material having a cellular structure.

3,982,488

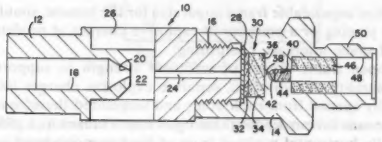
FLUERIC THROUGH BULKHEAD ROCKET MOTOR IGNITOR

Edward L. Rakowsky, Kinnelon, and Vincent P. Marchese, Morris Township, Morris County, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 19, 1975, Ser. No. 551,434

Int. Cl.[2] F42C *5/00*

U.S. Cl. 102—81 **1 Claim**



1. A rocket motor ignitor comprising a fluid resonance heating device comprised of a housing having an inlet port that is connected to a converging nozzle that injects fluid into a resonance tube with an open end to produce heating at said open end of said tube and exhaust ports for exhausting fluid from said housing; said heating device being connected to a propellant housing containing a first explosive charge that is in heating relation to said fluid resonance heating device for receiving heat therefrom, said fluid resonance heating device open end and said first explosive charge being separated by a metal closure disk and said first explosive charge being comprised of a first pickup charge adjacent said metal closure disk and a donor charge contiguous said first pickup charge; a second explosive charge mounted in said propellant housing and spaced from said first explosive charge by a thick bulkhead, said second explosive charge being comprised of a second pickup charge adjacent said bulkhead and a receptor charge contiguous said second pickup charge; and a solid propellant mounted in said housing adjacent said second explosive charge for being ignited thereby.

3,982,489

KINETIC ENERGY RING PROJECTILE

Abraham Flatau, 2003 Stockton Road, Joppa, Md. 21085; Donald N. Olson, 38 Atherton Road, Lutherville, Md. 21093, and Miles C. Miller, 504 Haverhill Road, Joppa, Md. 21085

Filed Nov. 29, 1972, Ser. No. 310,625

Int. Cl.[2] F42B *11/36, 13/00*

U.S. Cl. 102—92.4 **7 Claims**

1. A non-lethal, non-fragmenting, kinetic energy type rotatable projectile comprising: an annular ring shaped, closed structure of a tear drop airfoil cross-section; said structure being composed of resilient material and defined externally by major annular inner and outer surfaces defining the diametric extent of said structure, and being terminated by leading and trailing edges defining the longitudinal extent of said structure; said structure defining an internal annular hollow portion which is occupied by a second unified material.

3,982,490

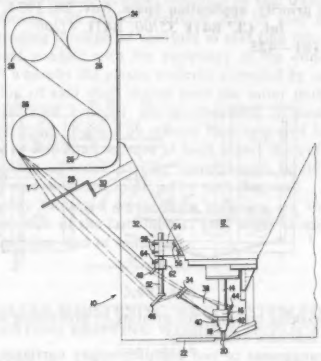
YARN JERKER SYSTEM FOR TUFTING MACHINES

Fred Bury, Blackburn, England, assignor to The Singer Company, New York, N.Y.

Filed Sept. 17, 1975, Ser. No. 614,031

Int. Cl.[2] D05C *15/18*

U.S. Cl. 112—79 R **5 Claims**



1. A yarn jerker system for a tufting machine having a frame supporting a reciprocating needle bar carrying a plurality of needles, said jerker system comprising a fixed jerker carried on the frame, and a reciprocating jerker carried by said needle bar for pulling yarn from the fixed jerker, at least one of said jerkers comprising first and second jerker members, means for adjustably mounting said first jerker member relative to said second jerker member and for adjustably mounting both said first and second jerker members relative to said tufting machine frame, whereby yarn threaded through said first jerker may be selectively controlled independently of yarn threaded through said second jerker.

3,982,491

AUTOMATIC SEWING MACHINE

William P. Herzer, Northborough, and Robert E. Cullen, Norwood, both of Mass., assignors to Union Special Corporation, Chicago, Ill.

Filed Aug. 12, 1974, Ser. No. 496,748

Int. Cl.[2] D05B *21/00*

U.S. Cl. 112—121.12 **71 Claims**

1. An automatic sewing machine comprising

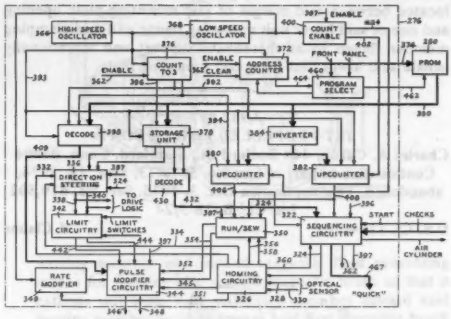
a sewing needle,

a work holder for holding a work piece during sewing,

a nondestructive, nonvolatile storage element having a plurality of randomly addressable storage locations, said storage locations containing instructions for positioning

the work holder and needle relative to one another in a plurality of positions,

electrical means for reading these instructions in a predetermined sequence, the electrical means having output signals representative of said sequentially read instructions, and



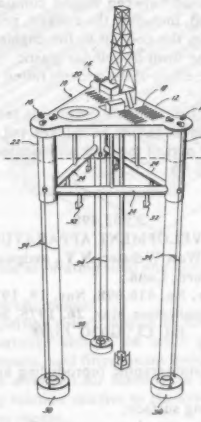
means responsive to said output signals for intermittently positioning the work holder relative to the needle at predetermined times to produce a predetermined pattern of movement and stitching without damaging the needle.

3,982,492

FLOATING STRUCTURE

Riddle E. Steddum, Houston, Tex., assignor to The Offshore Company, Houston, Tex.

Filed Apr. 25, 1975, Ser. No. 571,714
Int. Cl.² B63B *35/44*
U.S. Cl. 114—.5 D **6 Claims**



1. A floating structure adapted for mooring in a preselected position comprising

a platform having a reserve buoyancy, and

a plurality of mooring lines adapted to be connected to and extending vertically below said platform in parallel relationship to each other in the body of water in which the platform is floating,

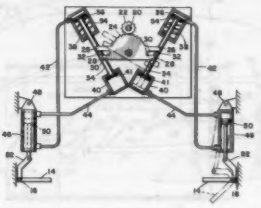
said mooring lines being pretensioned so that the ratio of such pretension to the platform displacement falls in the range from 0.05 to 0.30.

3,982,493

SKID CONTROL MECHANISM FOR BOATS

Charles W. Cronin, 3949 Kansas, San Diego, Calif. 92104

Filed June 26, 1975, Ser. No. 590,589
Int. Cl.² B63H *25/44*
U.S. Cl. 114—144 R **5 Claims**



1. A skid control means for a boat having a steering mechanism comprising:

a. a pair of rigid flaps longitudinally hinged to opposite sides of the bottom of said boat and deflectable on the hinges thereof from a neutral position substantially flush with the bottom of said boat to an open, water-engaging position;

b. power means for moving said flaps between said neutral position and said water-engaging position;

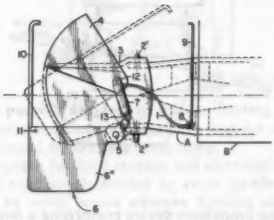
c. said power means being positively and directly operated by said steering mechanism such that upon steering to the left, one of said flaps is activated, and upon steering to the right, the other of said flaps is activated.

3,982,494

AUXILIARY RUDDER FOR A JET PROPULSION UNIT

Jouko Juhani Posti, 95230 Maksniemi, Finland

Filed Mar. 24, 1975, Ser. No. 561,148
Claims priority, application Finland, Mar. 27, 1974, 930/74
Int. Cl.² B63H *11/10*
U.S. Cl. 115—12 R **8 Claims**



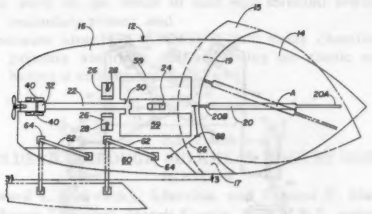
1. Auxiliary rudder apparatus for a water craft having a jet propulsion pump with a housing and a nozzle pivotably mounted on the housing for discharge of a propulsion jet, said apparatus comprising an auxiliary rudder element pivotably mounted on the nozzle for movement between a raised inoperative position and a lowered operative position, and a hydraulic cylinder coupled to the pump and the rudder element and operated by water pressure delivered by the pump to move the rudder automatically in inoperative position when the craft is driven at sufficiently high speed that the water pressure of the pump is adequate to operate the hydraulic cylinder.

3,982,495

BICYCLE POWERED BOAT

Gerald L. Hill, 1047 W. Union St., Whitehall, Pa. 18052

Filed June 9, 1975, Ser. No. 584,757
Int. Cl.² B63H *16/12*
U.S. Cl. 115—27 10 Claims



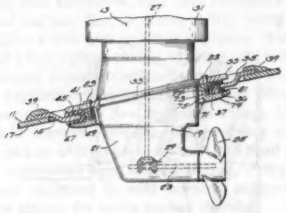
1. A bicycle powered boat comprising a single, hydrodynamically shaped hull, said hull having a forward section and a rear section, the rear portion of said forward hull section terminating in an arcuate surface and the forward portion of the rear hull section terminating in an arcuate surface, said arcuate surfaces being in frictional engagement with each other along an arcuate plane, means for securing said rear hull section to at least one portion of a bicycle, propeller and drive means connected to the aft portion of said rear hull section and positioned to be driven by engagement with the rear wheel of a bicycle, and means for securing said forward hull section to the front wheel portion of a bicycle for turning said front hull section relative to said rear hull section for steering said boat.

3,982,496

SEAL AND ISOLATION MOUNTING SYSTEM

Clarence E. Blanchard, Kenosha, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation-in-part of Ser. No. 482,468, June 24, 1974. This application Nov. 17, 1975, Ser. No. 632,267
Int. Cl.² B63H *5/00*
U.S. Cl. 115—.5 S 14 Claims



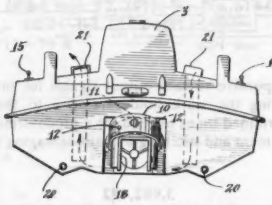
1. A marine propulsion device comprising a mounting plate adapted to be secured to the bottom of a boat hull in watertight relation and having therein an endless surface defining an opening, and a margin extending from said endless surface, a resilient member comprising an annular sealing portion including an endless surface defining a central opening and a plurality of angularly spaced extension which project outwardly from said annular sealing portion and constitute elastomeric mounts, a clamping member including an annular portion located within said central opening of said resilient member and defining a central opening and a flange portion extending outwardly from said annular portion, a marine propulsion lower unit extending through said opening in said clamping member and including a mounting flange, and means securing said clamping member to said mounting flange with said annular sealing portion of said resilient member located between said mounting plate and at least one of said lower unit mounting flange and said clamping member so as thereby to effect a watertight seal between said mounting plate and at least one of said lower unit mounting flange and said clamping member so as thereby to effect a watertight seal between said lower unit and said mounting plate and with said extension located between said margin of said mounting plate opening and one of said lower unit mounting flange and said clamping member flange so as thereby to support and vibrationally isolate said lower unit from said mounting plate.

3,982,497

JET-PROPELLED POWER BOAT

Charles A. Caron, 444 Bedford St., Stamford, Conn. 06904

Continuation-in-part of Ser. No. 507,073, Sept. 18, 1974, abandoned. This application Oct. 3, 1975, Ser. No. 619,502
Int. Cl.² B63B *5/24*
U.S. Cl. 115—70 5 Claims



1. In a jet propelled, high speed fiberglass boat provided with a cockpit and deck raised above the floor of the cockpit on all sides, fore, aft, and both sides, a jet tunnel completely external to the boat and driven by an inboard engine, the improvements which comprise, in combination,

a. a completely rounded bow having a continuous surface,
b. a solid bulkhead between engine compartment and the rest of the boat, including the cockpit, preventing flow of any water from the cockpit to the engine compartment,
c. flotation in the form of cellular plastic,
d. rails along the edges of the cockpit raised above the deck, and
e. separate and independent ventilating means for the engine compartment having air intakes and exhaust at least as high as any part of the deck and located inboard of the rails.

3,982,498

DEVELOPMENT APPARATUS

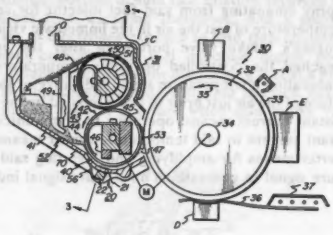
David G. Wilcox, West Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 416,898, Nov. 19, 1973, Pat. No. 3,915,121. This application Mar. 26, 1975, Ser. No. 562,290
Int. Cl.² G03G *15/08*
U.S. Cl. 118—637 17 Claims

1. In an electrostatographic reproducing apparatus including:

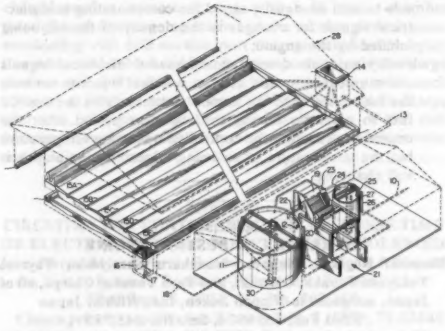
a moving imaging surface;
means for forming an electrostatic image on said surface;
a developer supply means;
a development means for developing said electrostatic image on said imaging surface by the application of developer thereto comprising a moving member for supporting a first magnetic brush of said developer;
first magnetic field generating means for forming said first magnetic brush so that it extends out from said moving member with a first height; and
means for moving said member between said supply means and a development zone; the improvement wherein, said apparatus further includes:

means for reducing the height of said first magnetic brush, said height reducing means comprising a stationary member for supporting a second magnetic brush of said developer, said stationary member being spaced from said



moving member and second magnetic field generating means for forming said second magnetic brush so that it extends out from said stationary member toward said moving member so as to engage said first magnetic brush to reduce said first height.

3,982,499
CONVERSION OF ANIMAL WASTE
Gerald P. Frankl, 342 Security Bank Bldg., Sioux City, Iowa 51101
Filed Jan. 30, 1975, Ser. No. 545,584
Int. Cl.² A01K 1/00
U.S. Cl. 119—16 **27 Claims**



8. Apparatus for separating solid and liquids from a mixture comprising:

a cylindrical drum means,

means for imparting rotary motion to said drum means,

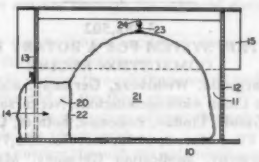
filter means arrayed around the lower peripheral area of said drum means, said filter means including a plurality of spaced bars arranged for forming an arcuate surface in surrounding relation relative to the lower peripheral area of said drum means,

fluidically porous endless belt means arranged to move between said spaced bars and said drum means for compressing said mixture against said drum means,

means introducing said mixture between said drum means and said filter means at the point the peripheral edge of said drum means is rotationally moving downward for compressing said mixture between said drum means and said filter means, and

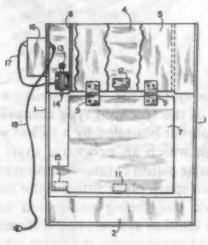
means for collecting the liquid passing through said endless belt and the space between said spaced bars, whereby liquid from said mixture will pass through said filter means while solids will pass between said drum and will be discharged at the peripheral edge of said drum when said drum is moving upward.

3,982,500
LINER FOR DOGHOUSE
Orlean F. Marlatt, 1823 E. Broadway, Enid, Okla. 73701
Filed Feb. 7, 1975, Ser. No. 547,764
Int. Cl.² A01K 1/02
U.S. Cl. 119—19 **5 Claims**



1. In combination with a doghouse having side walls, a roof and an entrance, a liner having an entrance portion with first and second ends and a bag lining portion, means for securing said bag lining portion to said first end, means for releasably rigidly securing said second end around the entrance of said doghouse and means for releasably attaching the outside of said bag portion at at least one location to the inside of said roof of said doghouse.

3,982,501
AUTOMATIC DOG AND CAT FEEDER
Angelo T. Marzocco, 4600 Nelson St., Fremont, Calif. 94538
Filed Dec. 4, 1974, Ser. No. 529,572
Int. Cl.² A01K 5/02
U.S. Cl. 119—51.14 **2 Claims**



1. A dual purpose device primarily for feeding a dog or cat at a predetermined time automatically and for timing other devices if desired by the user comprising:

a compartment for food storage and electrical apparatus;

front and rear panels divided by cross members and supported by outer braces whereby forming said compartment;

a lid to close or open top of said compartment;

a lower panel to close or open bottom of said compartment;

means for attaching said panel to said compartment whereby enabling said lower panel to swing opening or closing said compartment;

a lower compartment for holding and positioning a separate tray or pan under said food compartment;

a base panel fastened between same said outer braces of said food compartment whereby forming the said lower compartment;

whereby all above said structures forming a single portable unit;

said device further includes a push type solenoid with selected thrust power and stroke of said solenoid rod means

for attaching and positioning said solenoid to interior wall of said front panel of said food compartment whereby when said lower panel of said food compartment is in a closed position and held closed by said magnetic catch and the said solenoid is activated a thrust action of said solenoid rod will make contact with a striker plate attached to said lower panel overpowering pull of said magnetic catch thereby releasing said lower panel from said food compartment, and allowing food in said food compartment to fall downward by gravity to said tray positioned in said lower compartment.

3,982,502

IGNITION SYSTEM FOR A ROTARY PISTON COMBUSTION ENGINE

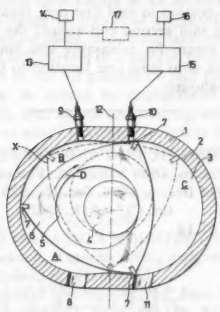
Siegfried Bargenda, Weinsberg, Germany, assignor to Audi NSU Auto Union Aktiengesellschaft, Neckarsulm, Wurtt and Wankel GmbH, Lindau, Bodensee, both of, Germany

Filed Mar. 6, 1975, Ser. No. 555,790

Claims priority, application Germany, Mar. 16, 1974, 2412772

Int. Cl.² F02B *53/12*

U.S. Cl. 123—8.09 **4 Claims**



1. An ignition system for a four-stroke rotary piston combustion engine of the trochoid type comprising: a casing having an inner chamber bounded by a jacket with dual arc inside contour through which an eccentric shaft with an eccentric passes, a triangular piston rotatably mounted on said eccentric shaft, at least two spark plugs fitted in the jacket near the short axis, each spark plug being connected to its own ignition generator in an ignition system, and different ignition systems for the individual spark plugs, the spark plugs being mounted before and after the short axis along the rotational direction of the piston. the spark plug mounted before the short axis being connected to an ignition system that creates a long spark tail and the spark plug mounted after the short axis being connected to an ignition system that creates a high voltage rise speed.

3,982,503

AIR DENSITY COMPUTER FOR AN INTERNAL COMBUSTION ENGINE FUEL CONTROL SYSTEM

Theodore W. Keranen, Pontiac, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Aug. 23, 1972, Ser. No. 283,144

Int. Cl.² F02B *3/00*; F02D *1/04*

U.S. Cl. 123—32 EA **3 Claims**

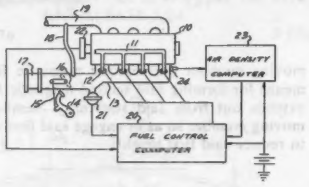
1. A fuel control system for an internal combustion engine having a controlled operating temperature, a throttle controlled air intake manifold, and at least one electrically controlled fuel injector mounted in the air intake manifold proximate the engine's intake valve port for spraying fuel into the engine in response to electrical signals comprising:

sensor means including an intake manifold pressure sensor adapted for communication with an internal combustion engine for generating signals indicative of the engine's operating parameters;

a temperature sensor means mounted in the air intake manifold proximate said fuel injector and outside the fuel spray emanating from said fuel injector for sensing the temperature of just the air in the immediate vicinity of the engine's intake valve port even after the engine has reached the controlled operating temperature and for generating a temperature signal indicative of the temperature of the air just prior to being inhaled by the engine;

constant current means, operative to communicate a constant current to said temperature sensor means;

inverter means for amplifying and inverting said temperature signal to generate an air density signal indicative of



the relative density of the air being inhaled by the engine; and

a fuel control computer responsive to said sensor means signals including the signals from said pressure sensor for generating electrical signals indicative of the engine fuel requirements, said fuel control computer further responsive to said air density signal for compensating said electrical signals for changes in the density of the air being inhaled by the engine;

whereby said air density compensated electrical signals communicated to said at least one fuel injector controls the fuel delivery to the engine and maintains the desired fuel to air ratio during the warm-up period after the engine has reached the controlled operating temperature but the temperature of air being inhaled by the engine is still changing.

3,982,504

INTERNAL COMBUSTION ENGINE

Masaaki Noguchi, Nagoya; Masaharu Sumiyoshi, Toyota; Yukiyasu Tanaka, Okazaki, and Taro Tanaka, Chiryu, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Feb. 25, 1974, Ser. No. 445,785

Claims priority, application Japan, Feb. 27, 1973, 48-23926; Nov. 6, 1973, 48-124663; Nov. 13, 1973, 48-127952; Nov. 23, 1973, 48-131836

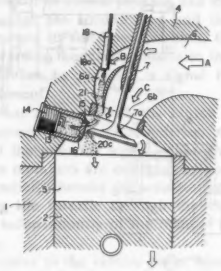
The portion of the term of this patent subsequent to Aug. 17, 1993, has been disclaimed.

Int. Cl.² F02B *19/10*, *19/16*

U.S. Cl. 123—32 SP **20 Claims**

1. An internal combustion engine including a cylinder, a piston, a cylinder head cooperating with said cylinder and said piston to define a main combustion chamber for the combustion of a lean air-fuel mixture, an intake valve having a valve stem and a valve head connected thereto, a suction port for introducing principally air or a lean air-fuel mixture to said main combustion chamber, a trap chamber for receiving a rich air-fuel mixture to provide a torch jet ignition and having at least one suction aperture through which said rich mixture is supplied into said trap chamber when said intake valve is opened, said suction aperture being so positioned to be upstream of said valve head when said intake valve is opened, said trap chamber also having at least one discharge aperture, means including said valve head in position downstream of said suction aperture for introducing said rich air-fuel mixture

to said suction aperture, said suction and discharge apertures always being in communication with said main chamber during the time when said intake valve is kept closed so that the torch jet can spurt through both of said apertures, and so that during the compression stroke, the pressure at said suction and discharge apertures is substantially equal thereby preventing a substantial portion of said rich mixture received in said trap chamber from escaping therefrom, and a spark plug having a set of electrodes exposed to said trap chamber, the improvement comprising a fuel injection nozzle provided upstream of said intake valve for discharging fuel at a pressure higher than atmospheric pressure so that the rich mixture is supplied to said suction aperture when said intake valve is



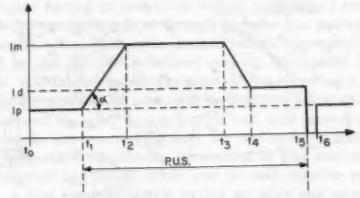
opened, and a separating wall which is provided in said trap chamber between said suction aperture and said discharge aperture and which separates said trap chamber into two portions, a suction portion and a discharge portion, the discharge portion communicating with said main chamber through said discharge aperture and the suction portion communicating with said suction port through said suction aperture when said valve head is in its open position, said discharge portion and said suction portion communicating with each other at a position remote from said suction and discharge apertures, thereby facilitating the introduction of the rich mixture through said suction aperture to said set of electrodes and holding said mixture thereat.

3,982,505

CIRCUITRY FOR CONTROLLING THE RESPONSE TIME OF ELECTROMAGNETIC DEVICES WITH A SOLENOID

Jean-Pierre Rivere, Paris, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Sept. 5, 1974, Ser. No. 503,460
Claims priority, application France, Sept. 5, 1973, 73.32080
Int. Cl.² F02B *3/00*
U.S. Cl. 123—32 EA **6 Claims**



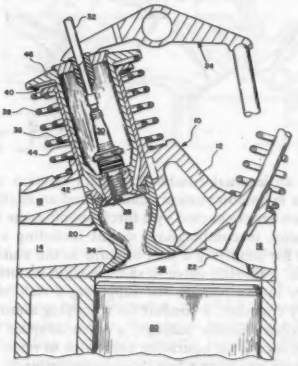
1. A method for controlling the response time of an electromechanical device having an actuating solenoid comprising:
applying three reference voltages from three reference voltage sources in a predetermined order to a voltage and current amplifier which drives the solenoid;
generating from the three reference voltages three corresponding currents through the solenoid, the three currents being a premagnetization current, a maximum excitation current of the solenoid and a de-excitation current of the solenoid;
sending the premagnetization current through the solenoid during a first phase;
saturating a source of reference voltage located at the input of an integrator which transforms the constant voltage of the source into a voltage which increases linearly with time;
applying the linearly increasing voltage to the voltage and current amplifier;
sending a current which increases linearly to the maximum excitation current through the solenoid during a second phase;
maintaining the maximum excitation current through the solenoid during a third phase;
decreasing the current through the solenoid to de-excitation value at the end of the third phase;
maintaining the de-excitation current through the solenoid during a fourth phase; and
reducing the current through the solenoid to zero during a fifth phase before the cycle is restarted by sending a premagnetization current through the solenoid.

3,982,506

STRATIFIED CHARGE INTERNAL COMBUSTION ENGINE

John W. Holtrop, Rte. 1 Box 2052, Ridgecrest, Calif. 93555

Filed Apr. 28, 1975, Ser. No. 572,478
Int. Cl.² F02B *19/16, 17/00*
U.S. Cl. 123—75 B **3 Claims**



1. In an internal combustion reciprocating engine including a cylinder having a bore extending therethrough, a cylinder head having a substantially flat surface closing one end of the cylinder bore and a piston reciprocating in the cylinder bore, the improvement comprising:
a fuel intake and ignition system combination including;
A. first and second intake ports in said cylinder head,
B. first and second valve means in said cylinder head normally closing said ports from communication to said cylinder bore,
C. each of said valve means being formed by hollow tubes coaxially arranged in said cylinder head for reciprocating sliding action with respect to each other and said cylinder head,
D. said first valve means cooperating with said first port to admit a lean air-fuel mixture to said cylinder bore and having formed therein a rich mixture combustion chamber,

E. said second valve means cooperating with said second port to admit a rich fuel mixture to said rich combustion chamber; and

F. ignition electrode means coaxial with said second valve means and terminating adjacent said rich mixture chamber for igniting mixture therein;

G. the time of opening of said valves and the ignition of said rich fuel mixture being regulated such that, at ignition, said rich fuel-air mixture exists substantially within said rich combustion chamber, said lean-air fuel mixture exists in said cylinder bore and combustion initiated in said rich fuel mixture flows into said cylinder bore to ignite said lean fuel-air mixture therein.

3,982,507

AFTERBURNING PREVENTION DEVICE FOR AN INTERNAL COMBUSTION ENGINE

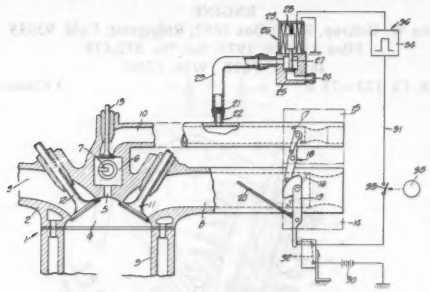
Urataro Asaka, Kamifukuoka; Toru Hatanaka, Asaka, and Katsuichi Shiroyama, Shiki, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 10, 1974, Ser. No. 531,314

Claims priority, application Japan, Dec. 11, 1973, 48-137360

Int. Cl.² F02D *31/00*

U.S. Cl. 123—97 B **4 Claims**



1. In an internal combustion spark ignition piston engine having a main combustion chamber and an auxiliary combustion chamber connected by a torch opening, the improvement comprising, in combination: means including a main intake passage for supplying a lean mixture to the main combustion chamber, a throttle valve in said passage, means including an auxiliary intake passage for supplying a rich mixture to the auxiliary chamber, a conduit for supplying atmospheric air to said auxiliary intake passage, a valve adapted to close said conduit, means for operating said valve to open said conduit, said means including a first device responsive to movement of said throttle valve toward closed position, said means also including a second device sensitive to speed of the engine, said first device including timing means, whereby said valve is opened for a timed interval when the throttle valve moves toward closed position while the engine speed is above a predetermined value.

3,982,508

SPEED REGULATORS FOR INTERNAL COMBUSTION ENGINES, PARTICULARLY DIESEL ENGINES, IN EARTH MOVERS AND WORKERS

Bertil Norlin, and Karl Oscar Olsson, both of Eslov, Sweden, assignors to Akermans Verkstad AB, Eslov, Sweden

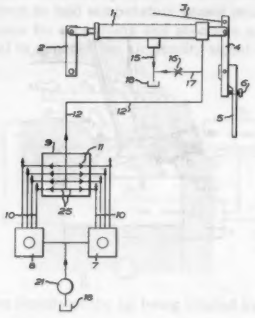
Filed Jan. 21, 1975, Ser. No. 542,809

Claims priority, application Sweden, Jan. 23, 1974, 7400846

Int. Cl.² F02D *11/02*

U.S. Cl. 123—97 R **6 Claims**

1. An automatic speed regulator for the internal combustion engine of an earth moving machine or the like of the type having at least one hydraulically operated implement, a source of hydraulic fluid under pressure, an hydraulic pressure line connected to said implement, the means to selectively supply hydraulic fluid under pressure to said implement through said pressure line, a manually operable fuel control linkage whereby the speed of said engine may be controlled by controlling the fuel to said engine, a fuel control means the novelty comprising connecting means connecting said fuel control linkage to said fuel control means, said connecting means including extensible and retractable means, means to constantly bias said extensible and retractable means in one direction to reduce the flow of fuel to said engine to reduce the



speed thereof, said extensible and retractable means including hydraulic means for biasing said extensible and retractable means to overcome the bias of said means to constantly bias said extensible and retractable means, said hydraulic means being connected to said source of hydraulic liquid under pressure when said hydraulically operated implement is supplied with fluid under pressure to operate it, and drain means for said extensible and retractable means so constructed and arranged that when fluid under pressure is not supplied to said implement, said extensible and retractable means will be biased by said means to constantly bias said extensible and retractable means to reduce the flow of fuel to said engine in order to reduce the speed thereof.

3,982,509

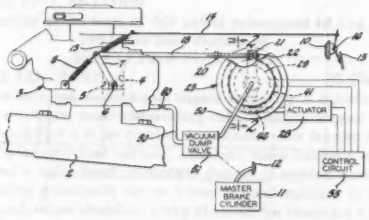
ENGINE THROTTLE POSITIONING APPARATUS

Ronald L. Colling, Millington, and Myron U. Trenne, Utica, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed July 14, 1975, Ser. No. 595,519

Int. Cl.² F02D *11/08*

U.S. Cl. 123—97 R **1 Claim**



1. Apparatus for positioning a throttle on a vehicle mounted engine, manually or in response to an override signal, in or between a closed position for minimum engine power and a full open position for maximum engine power, the vehicle including brake means, the throttle positioning apparatus comprising:

return spring means attached to the throttle and effective to bias the throttle toward its closed position;

manual throttle positioning means attached to the throttle through a lost-motion spring having a greater spring constant than the return spring and effective to move the throttle against the return spring bias to an open position, whereby the throttle can be manually set;

a rigid link attached to the throttle to position the throttle independently of the manual throttle positioning means, the rigid link including first and second spaced stops;

clutch means including driving means and driven means, the driven means extending between the rigid link stops and movable, when engaged by the driving means, in one direction to engage the first stop and thereby move the throttle toward its closed position and in the other direction to engage the second stop and thereby move the throttle toward its full open position, the clutch means further including means responsive to the position of the driven member to generate a signal indicative of the position thereof;

actuator means engaged with the clutch driving member and responsive to the clutch driven member position signal and the override signal, when the clutch driving and driven members are engaged, to position the clutch driven member, whereby the actuator means is capable of positioning the throttle through the clutch means and rigid link independently of the manual throttle positioning means;

means responsive to the vehicle brake means to generate a signal indicative of the actuation thereof; and

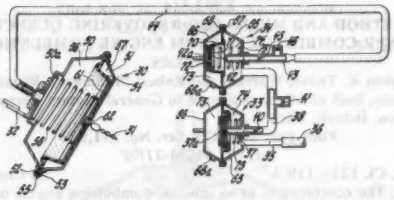
means responsive to the brake actuation signal to disengage the clutch means driving and driven members and thereby prevent throttle control by the override signal during vehicle braking.

3,982,510

THROTTLE MOTION CONTROL DEVICE

David L. Van Ostrom, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 15, 1975, Ser. No. 605,143
Int. Cl.² F02D *11/08*
U.S. Cl. 123—103 E **3 Claims**



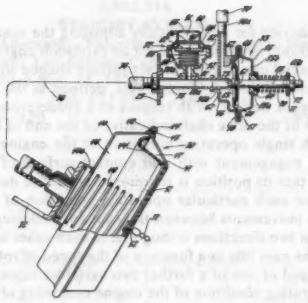
1. A throttle motion control device for an internal combustion engine having an induction system including a movable throttle for controlling flow through an induction passage and a manually actuated throttle control means operatively connected to the throttle to effect opening movement of the throttle, said throttle motion control device including a pneumatic power unit having a housing divided into a first chamber and a second chamber by a movable wall, said second chamber being in communication with the atmosphere, a flexible power connector operatively connected at one end to said movable wall and at its other end to said throttle control means, a first vacuum switch having an inlet and an outlet, said inlet being connected to said induction passage downstream of said throttle, a second vacuum switch having an inlet and an outlet, a first conduit means connecting said inlet of said second vacuum switch to said outlet of said first vacuum switch, said first conduit means including a first orifice controlling flow through said conduit means and a first bleed orifice to the atmosphere positioned between said first orifice and said second vacuum switch, a second conduit means connecting said outlet of said second vacuum switch to said first chamber, said second conduit means having a second orifice therein to control flow through said second conduit means and a second bleed orifice to the atmosphere positioned between said second orifice and said first chamber, said first vacuum switch and said second vacuum switch each being operable at selective predetermined inlet vacuum pressures to apply vacuum pressure in said first chamber whereby said power unit is actuated to apply a force of predetermined value to said throttle control means in a throttle closing direction.

3,982,511

THROTTLE MOTION CONTROL DEVICE

Robert C. Schniers, and David L. Van Ostrom, both of Flint, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 13, 1975, Ser. No. 549,542
Int. Cl.² F02D *11/08*
U.S. Cl. 123—103 E **4 Claims**



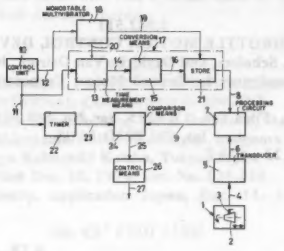
1. A throttle motion control device for an automotive vehicle internal combustion engine used to warn the driver of excessive fuel consumption, as during acceleration, by providing a stiff accelerator pedal feel when manifold vacuum drops below a predetermined value, the engine having an introduction system including a movable throttle for controlling flow through an induction passage and a manually actuated throttle control means operatively connected to the throttle to effect opening movement of the throttle, said throttle motion control device including a pneumatic power unit having a housing divided into a first chamber and a second chamber by a movable wall, said second chamber being in communication with the atmosphere, a flexible power connector operatively connected at one end to said movable wall and at its other end to said throttle control means, a vacuum control valve having an inlet and an outlet, said inlet being connectable to said induction passage, a conduit connecting said outlet to said first chamber, said vacuum control valve being operable at a predetermined vacuum pressure in said induction passage to place said first chamber in fluid communication via said outlet and said inlet with said induction passage and, a vacuum pressure regulator operatively connected to said conduit between said first chamber and said vacuum control valve to limit vacuum pressure to said first chamber of said power unit to a predetermined maximum pressure value whereby said power unit can be actuated at a predetermined vacuum pressure to apply a force of maximum predetermined value to said throttle control means in a throttle closing direction.

3,982,512

DEVICE FOR AUTOMATICALLY ADJUSTING THE SPARK TIMING IN AN ELECTRONIC IGNITION SYSTEM FOR AN EXPLOSION ENGINE

Giampaolo Garcea; Filippo Surace, and Edgardo Rogora, all of Milan, Italy, assignors to Alfa Romeo S.p.A., Milan, Italy

Filed Aug. 8, 1973, Ser. No. 386,744
Claims priority, application Italy, Aug. 16, 1972, 28235/72
Int. Cl.² F02P *5/04, 1/00*
U.S. Cl. 123—117 R **12 Claims**



1. A device for automatically adjusting the spark timing in an electronic ignition system for an explosion engine, comprising a spacial cam with a contact surface shaped so that its lifts represent the desired timing angle, defined as the angle of lag of the spark delivery with respect to a predetermined angular position of the drive shaft indicative of the end of dwell angle, for each single operating condition of the engine, a follower kept in engagement with said contact surface of the spacial cam so that its position is representative of the desired timing angle for each particular operating condition of the engine, relative movements between the cam and follower being provoked in two directions orthogonal to each other and orthogonal to the cam lifts as a function of the speed of rotation of the engine and of one of a further two variables representative of the operating condition of the engine consisting of the throttle angle and the suction in the engine intake pipe, and further comprising a transducer associated with said follower so as to produce a first electrical signal of a value variable with the position of the follower, switch means for measuring the time necessary for the engine to rotate through a predetermined dwell angle at each complete cycle of a cylinder of the engine, means for converting said time measurement into a second electrical signal, means for processing said first and second electrical signals to obtain a third electrical signal representative of the lag time corresponding to the desired timing angle measured by the follower, a timer operated at the moment of passage of the engine from said predetermined angular position indicative of the end of dwell angle so as to produce a fourth electrical signal of a value which increases with time, means for comparing said third and fourth signals and means for controlling the delivery of the spark which is sensitive to the attainment by said fourth signal of the value of said third signal.

3,982,513

CARBURETOR FOR TORCH IGNITED ENGINE

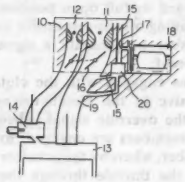
Yasuhiko Nakagawa, Fujisawa, and Méroji Nakai, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 3, 1974, Ser. No. 466,880
Claims priority, application Japan, May 7, 1973, 48-50479
Int. Cl.² F02B *33/00*
U.S. Cl. 123—119 D **3 Claims**

1. In a combination of an internal combustion engine of the torch ignition type having a main combustion chamber and an antechamber provided with an ignition means and arranged fluidly in communication with the main combustion chamber such that a flame propagates from the antechamber to the main combustion chamber when a combustible mixture is ignited in the antechamber, and a carburetor having a main barrel provided with a main fuel jet and a main throttle valve for supplying a lean air-fuel mixture into the main combustion chamber, a secondary barrel for supplying a rich air-fuel mixture into the antechamber, and a float chamber, the improvement comprising:

an auxiliary passageway communicating with the atmosphere an opening exclusively into the main barrel downstream of the main throttle valve;

an auxiliary fuel jet communicating with the float chamber and opening into said auxiliary passageway; and a valve disposed in said auxiliary passageway between said auxiliary fuel jet and the main barrel, said valve being normally closed and adapted to open only when the magnitude of the negative gage pressure in an engine intake manifold exceeds a predetermined value, this value being reached during deceleration operation of the engine, so that an auxiliary air-fuel mixture may be drawn into the main barrel through said auxiliary passageway only during deceleration operation, in which said auxiliary air-fuel mixture is richer than said lean air-fuel mixture, so that spark-ignition in said antechamber and torch-ignition in said main combustion chamber are facilitated when said valve remains open due to fuel-enrichment of said lean air-fuel mixture which is fed to said main combustion chamber and is partly discharged into said antechamber.



3,982,514

METHOD AND MEANS FOR RECOVERING QUENCH LAYER COMBUSTIBLES FROM ENGINE COMBUSTION CHAMBERS

Stephen R. Turns, Warren, and Robert M. Siewert, Birmingham, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 21, 1975, Ser. No. 551,542
Int. Cl.² F02M *31/00*
U.S. Cl. 123—119 A **6 Claims**

1. The combination in an internal combustion engine of

wall means defining a variable volume combustion chamber in which cyclic combustion of air-fuel mixtures is performed in repetitive cycles including admission, compression, combustion, expansion and exhaust steps,

inlet and exhaust means for respectively admitting air-fuel mixtures to the chamber in the admission step and discharging burned products from the chamber in the exhaust step,

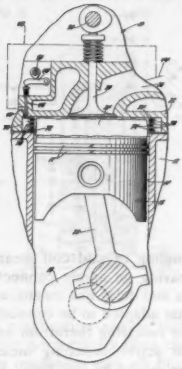
said combustion step leaving a quench layer of unburned and partially burned combustibles on said wall means which may be stripped off and discharged in the exhaust step, and the improvement comprising,

a collection volume adjacent said combustion chamber and separated therefrom by a stationary portion of said wall means, said portion having an areal pattern of perforations substantially coextensive therewith and interconnecting said combustion chamber and collection volume through said wall portion,

passage means connecting said collection volume to said inlet means,

valve means controlling the flow of fluids from said combustion chamber through said collection volume to said inlet means, and

actuating means operable in predetermined relation to the engine operating cycle to open said valve means for predetermined portions of the expansion and exhaust steps



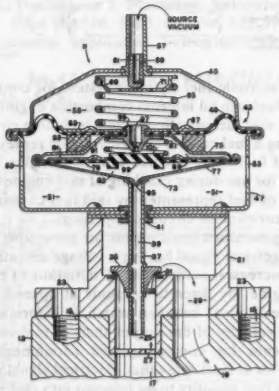
of said combustion chamber cycle, the timing of said opening being effective to selectively strip the quench layer from said stationary wall means portion and recirculate the quench layer products to the inlet means for readmission to the combustion chamber, thus preventing discharge of the recirculated quench layer combustibles to said exhaust means.

3,982,515

EXHAUST GAS RECIRCULATION CONTROL ASSEMBLY

Cyril E. Bradshaw, Kalamazoo, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 26, 1974, Ser. No. 464,379
Int. Cl.² F02M 25/06
U.S. Cl. 123—119 A 5 Claims



1. An exhaust gas recirculation controller of the type having structure defining an exhaust gas inlet and an exhaust gas outlet for recirculating exhaust gas in an internal combustion engine, said controller comprising:

a. housing means defining a vacuum chamber including first port means adapted for communicating with a source of vacuum, second port means communicating said vacuum chamber with the atmosphere;

b. first pressure responsive means disposed within said housing and movable in response to changes in vacuum in said chamber;

c. valve means operative to control communication of said exhaust gas inlet with said exhaust gas outlet, said valve means including a valve seat and a movable poppet;

d. means movably disposed within said housing means and defining an exhaust gas chamber including second pressure responsive means operatively movable in response to changes in exhaust gas pressure in said exhaust gas chamber for controlling flow of atmospheric air through said second port means; and

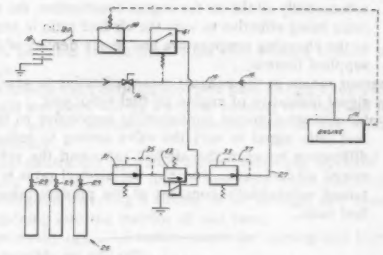
e. hollow stem means defining an exhaust gas passage continuously communicating said exhaust gas inlet with said exhaust gas chamber wherein said passage passes axially through said movable poppet and said hollow stem means is operable to move said poppet in response to movement of said first pressure responsive means.

3,982,516

STANDBY SYSTEM

Kenneth T. Abernathy, Valencia, Calif., assignor to Dual Fuel Systems, Inc., Los Angeles, Calif.

Filed Nov. 11, 1974, Ser. No. 522,514
Int. Cl.² F02M 21/02
U.S. Cl. 123—120 8 Claims



1. A standby system to provide a gaseous fuel to an internal combustion engine in the event of failure of a primary source of fuel, the system comprising:

a. means for providing an alternate source of a gaseous fuel;

b. means for communicating the alternate source with a fuel-air mixer of the engine including a line between the alternate source and the fuel-air mixer;

c. means for preventing communication between the alternate source and the fuel-air mixer unless the engine is producing a vacuum including:

i. normally open switch means responsive to engine vacuum to close; and

ii. normally closed solenoid valve means in the line, the coil of the solenoid valve means being in series electrical circuit with the vacuum switch means;

d. means for preventing communication between the alternate source and the fuel-air mixer unless there is a failure of the primary source including a normally open pressure switch means responsive to a predetermined lower than normal pressure in the primary source to close, the pressure switch means being in series circuit with the vacuum switch means and the coil of the solenoid valve means; and

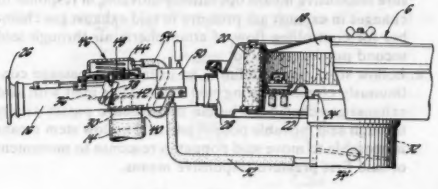
e. both communication prevention means include means for providing electrical current to the circuit through both switch means and the coil of the solenoid valve means.

3,982,517

CLOSED LOOP CARBURETOR AIR-FUEL RATIO CONTROL

Douglas I. Fales, and William H. Holl, both of Flint, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 20, 1975, Ser. No. 623,966
Int. Cl.² F02M 31/00
U.S. Cl. 123—122 D 1 Claim



1. Apparatus for maintaining a substantially constant predetermined air-fuel ratio in a combustion engine having a carburetor and exhaust means, the apparatus comprising:

means for heating atmospheric air;

a metering valve effective to mix heated air from the air heating means with atmospheric air in variable ratio to produce air of varying temperature and hence density determined by the setting of the metering valve, the metering valve communicating with the carburetor to supply substantially all the air for engine combustion, the carburetor being effective to vary the air-fuel ratio in response to the changing temperature and hence density of the air supplied thereto;

sensor means in the exhaust means effective to generate a signal indicative of engine air-fuel ratio; and

valve actuation means continuously responsive to the air-fuel ratio signal to vary the valve setting to reduce the difference between the air-fuel ratio and the predetermined air-fuel ratio, whereby the air-fuel ratio is maintained substantially constant at the predetermined air-fuel ratio.

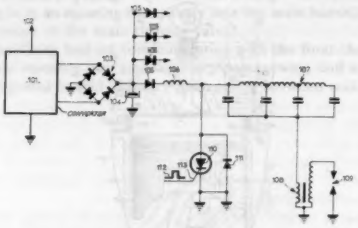
3,982,518

ELECTRONIC IGNITION DEVICE FOR INTERNAL COMBUSTION ENGINES

André Gabriel Lapeyronnie, Paris, France, assignor to Fournitures Internationales de Materieles Electroniques, Paris, France

Division of Ser. No. 298,025, Oct. 16, 1972, Pat. No. 3,905,347. This application Jan. 28, 1975, Ser. No. 544,935
Claims priority, application France, Oct. 14, 1971, 71.36966
Int. Cl.² F02P 1/00
U.S. Cl. 123—148 CB 3 Claims

1. In an electronic ignition system for an internal combustion engine, a spark plug, coil means having primary and secondary windings, said secondary winding being connected electrically to said spark plug, delay line means connected electrically to said primary winding of said coil means for storing a voltage to be transferred to said primary winding during an interval determined by said delay line means, said delay line means also forming a buffer circuit, converter means for converting the D.C. voltage of a battery to an A.C. voltage, said converter means having an output, rectifier bridge means connected to said output of said converter means for converting the A.C. voltage thereof to a D.C. voltage, said rectifier bridge means having an output where the latter D.C. voltage is available, a diode and a capacitor means both connected to said output of said rectifier bridge means, said capacitor means being grounded for connecting the output of said rectifier bridge means to ground, a choke connected in series with said diode and said delay line means between the latter and said diode for transmitting the D.C. voltage available at said output of said rectifier bridge means to said delay line means to be stored thereby for transmission



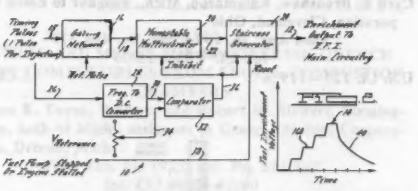
to said primary winding of said coil means, and an active switching means having an anode connected to a junction between said choke and delay line means, a cathode which is grounded, and a gate adapted to be connected with a switching logic circuit for receiving therefrom an activating pulse which renders said active switching means conductive to transmit the voltage stored by said delay line means to said primary winding of said coil means during a time determined by said delay line means.

3,982,519

ELECTRONIC-FUEL-INJECTION-SYSTEM ENRICHMENT CIRCUIT FOR USE DURING ENGINE CRANKING

Roger A. Moon, Ypsilanti, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 27, 1975, Ser. No. 581,079
Int. Cl.² F02N 17/00
U.S. Cl. 123—179 L 6 Claims



1. In an electronic fuel injection system for controlling the injection of fuel into an internal combustion engine having an output shaft, said fuel injection system including circuit means for generating a fuel control electrical signal representative of a quantity of fuel to be injected into said engine, an enrichment circuit for use during cranking of said engine to increase the quantity of fuel represented by said fuel control electrical signal, said enrichment circuit comprising:

staircase generator circuit means for generating an enrichment electrical signal having a voltage the magnitude of which increases, subsequent to initiation of cranking of said engine, by discrete amounts at spaced instants in time the interval between which is determined by the angular velocity of the output shaft of said engine; and

circuit means for combining said enrichment electrical signal with at least one other electrical signal representative of a fuel quantity to be injected into said engine, said combined electrical signals producing said fuel control electrical signal, and the variability with time of said enrichment electrical signal during cranking of said engine tending to increase, as a function of time subsequent

to initiation of cranking of said engine, the quantity of fuel represented by said fuel control electrical signal.

3,982,520

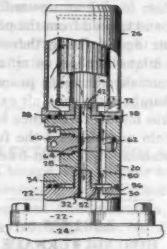
OIL FILTER MOUNTING MEANS

Bill L. Wheeler, P.O. Box 5, Cone, Tex. 79321

Filed Aug. 14, 1975, Ser. No. 606,203

Int. Cl.² F01M *1/10*; B01D *29/00*

U.S. Cl. 123—196 A **7 Claims**



1. An internal combustion engine including an oil filter mounting means for permitting a filter change without interruption of engine operation said oil filter mounting means comprising an adaptor member including adaptor mounting means engageable with the oil filter mounting engine fitting of the internal combustion engine to permit said adaptor to be mounted thereon, oil filter mounting adaptor fitting means on said adaptor means for permitting an oil filter to be mounted on said adaptor means, first conduit means extending through said adaptor means for providing communication between an oil outflow opening of said engine fitting and an inflow opening of an oil filter mounted on said adaptor fitting, second conduit means extending through said adaptor member for providing communication between an oil return opening of said engine fitting and an outflow opening of said oil filter mounted on said adaptor fitting and selectively operable valve means for closing said first and second conduit means to permit the changing of an oil filter member without interruption of engine operation.

3,982,521

HEAVY DUTY JIG SAW

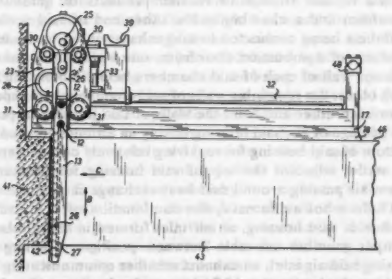
Hans Bieri, Toedistrasse 9, Pfaeffikon, Switzerland (8330)

Filed Oct. 20, 1975, Ser. No. 623,896

Claims priority, application Switzerland, Oct. 23, 1974, 14170/74

Int. Cl.² B28D *1/06*; B23B *45/14*

U.S. Cl. 125—16 R **8 Claims**



1. A jig saw comprising a first unit including base vacuum bell means, elastically flexible sealing skirt means secured to said bell means to face any supporting surface, elongated guide means rigidly secured to said bell means to extend substantially in parallel to said supporting surface, tool carrier means including a drive head movably secured to said elongated guide means, first hydraulic drive means as part of said tool carrier means for producing a reciprocating tool movement, separate second hydraulic drive means operatively connected to said tool carrier means for moving said tool carrier means along said elongated guide means, a second unit including vacuum pump means as well as hydraulic pump located remote from said first unit, and conduit means operatively interconnecting said first and second units.

3,982,522

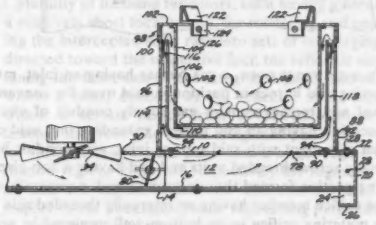
PORTABLE FORCED DRAFT COOKER

Fred W. Hottenroth, 1740 Interlachen St., Seal Beach, Calif. 90740, and Fred W. Hottenroth, III, 3415 Lama Ave., Long Beach, Calif. 90808

Filed Mar. 31, 1975, Ser. No. 563,842

Int. Cl.² F23M *3/18*

U.S. Cl. 126—2 **6 Claims**



1. A portable forced draft solid fuel burning cooker that includes:

a. a hollow duct defining elongate base having a top piece, said top piece having a central opening therein, and first and second openings on opposite sides of said central opening;

b. an electrically operated blower assembly mounted on said top piece, said blower assembly when electrically energized directing a stream of air through said central opening into the interior of said base;

c. manually operated switch means for turning said blower assembly on and off;

d. first and second pivotally supported dampers inside said base and intermediately disposed between said central opening and first and second openings for controlling the quantity of air flowing to said first and second openings when said blower assembly is electrically energized;

e. first and second heater assemblies mounted on said top piece above said first and second openings, each of said heater assemblies including an outer cylindrical shell secured to said top piece and in communication with the one of said first and second openings most adjacent thereto, a second inner cup shaped shell in which solid fuel is disposed, a ring that joins free peripheral edges of said first and second shells, said second shell of substantially less transverse area than said first shell and said first and second shells cooperating with said ring to define a confined space of annulus shape, a third cup shaped shell interposed in a fixed position between said first and second shells that subdivides said confined space into an outer first passage and an inner second passage in which air flowing thereto from said blower assembly is preheated by the combustion of said fuel prior to discharging across said fuel from a plurality of spaced openings in said second shell to support the combustion of said fuel, and first means for supporting said third cup shaped shell in a fixed position between said first and second shells; and

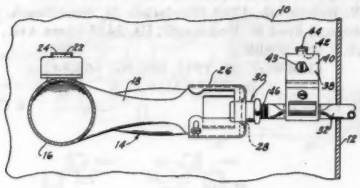
f. first and second handles operatively associated with said first and second dampers to control the position of the latter and regulate the quantity of air flowing from said blower assembly to said first and second heater assemblies.

3,982,523

MOUNTING MEANS FOR A DOMESTIC GAS OVEN BURNER ORIFICE MEMBER

John J. Love, and Thomas P. Fleer, both of St. Louis, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed June 3, 1974, Ser. No. 475,754
Int. Cl.[2] A21B *1/00*
U.S. Cl. 126—19 R 3 Claims



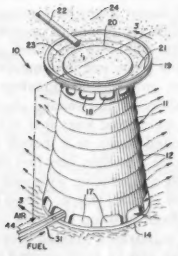
1. In a gas range oven, a gas burner having an inlet, means supporting said burner in position in said oven for convenient removal and replacement, a gas supply conduit of circular cross-section having an end portion extending into said oven in axial alignment with said burner inlet, said conduit being externally screw threaded at its end and having a non-circular locating portion formed therein near its end, a generally cup-shaped orifice member having an internally threaded side wall and a metering orifice in its bottom wall mounted in screw-threaded engagement on the end of said conduit, means for fixing the end of said conduit axially and longitudinally, comprising: a bracket having a first portion formed with surfaces lying parallel with and against the surfaces of said non-circular portion of said conduit and a second portion including a locating tang entered into a locating aperture in a wall of said oven, means clamping said first portion of said bracket to said conduit and means rigidly attaching said second bracket portion to the oven wall.

3,982,524

HEATER FOR ORCHARDS AND THE LIKE

Richard E. Diggs, 12 A Road, Carthage, Mo. 64836

Filed July 30, 1975, Ser. No. 600,453
Int. Cl.[2] A01G *13/06*
U.S. Cl. 126—59.5 13 Claims



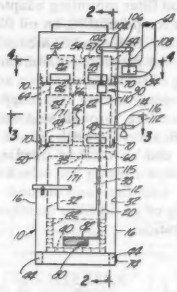
1. A substantially pollution-free heater for orchards and the like to prevent freeze damage to crops, comprising an upright, open-ended, stackable, heat-transmitting housing having air inlet ports in a lower side wall portion thereof and heat outlet ports in an upper side wall portion thereof, burner means supported in the housing near the lower end of the housing and including an elongate body with an upper end and a lower end and having a fuel supply passage extending longitudinally therethrough and opening at one end thereof axially outwardly through the upper end of the body, said fuel supply passage extending at its other end laterally outwardly through the side of the body and connected with a source of fuel; a generally dish-shaped air deflector plate supported on the body near the upper end thereof; a fuel dispersing plate supported on the upper end of the body in spaced relation to the air deflector plate and defining an air inlet chamber therewith, the air deflector plate having an upwardly directed side wall extending adjacent and spaced from the peripheral edge of the fuel dispersing plate and defining therewith an annular air outlet from the air inlet chamber; an air inlet to the chamber directed circumferentially thereinto to impart a swirling motion to air in the chamber, whereby air exiting the chamber is caused to spin to thus impart turbulence to the flow of air and fuel entrained therein and conveys the fuel to a combustion zone whereat substantially pollution-free turbulent combustion occurs.

3,982,525

HOT AIR FURNACE

John A. Herman, P.O. Box 125, St. Marys & First St., Suttons Bay, Mich. 49682

Filed Mar. 3, 1975, Ser. No. 554,507
Int. Cl.[2] F24H *3/14*
U.S. Cl. 126—99 R 17 Claims



1. In a hot air furnace, the combination of; a rectilinear housing having an exhaust outlet, a firebox disposed in said housing, a plurality of heat exchange members forming elongated chambers within said housing and above said firebox, passage means communicating said chambers in series, one chamber at one end of said series of chambers being connected to said firebox to receive products of combustion therefrom and a chamber at the other end of said series of chambers being connected to said exhaust outlet to discharge products of combustion therefrom, one wall of said housing and one wall of each of said chambers being in common with each other, the remaining walls of said chambers being spaced from each other and from the walls of said housing to permit the passage of air, said housing having an air inlet adjacent the bottom of said housing for receiving relatively cool air, and an air outlet adjacent the top of said housing for discharging warm air passing around said heat exchange members.

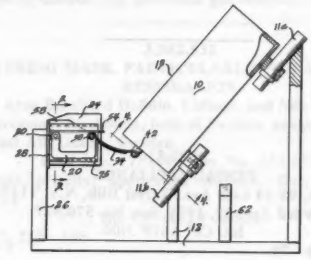
17. In a hot air furnace, the combination of; a housing, a firebox in said housing, an air inlet formed in said firebox, a damper member movable between positions opening and closing said air inlet, an exhaust member communicating with said housing and with said firebox, said exhaust member forming an air intake opening, a closure member movable between open and closed positions relative to said intake opening, control means movable in response to changes in temperature

in said housing and being operatively connected to said damper member to move the latter from an open towards a closed position upon an increase in temperature in said housing and to simultaneously move the latter from a closed toward an open position, said control means including a shaft rotatably mounted in said housing, a bimetal element coiled about said shaft and being responsive to changes in temperature to coil and uncoil, said bimetal element having one end connected to said shaft and the other end fixed relative to said housing whereupon changes in temperature in said housing rotates said shaft, means operatively connecting said damper member and said closure member to move the latter upon rotation upon said shaft, an arm member movable in response to movement of said shaft, and a weight member on said arm movable longitudinally thereof to vary the response of rotation of said shaft for any given temperature.

3,982,526
TURNING COLLECTORS FOR SOLAR RADIATION

Amitzur Z. Barak, Chicago, Ill., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed May 20, 1975, Ser. No. 579,179
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **12 Claims**



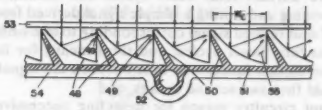
1. A device for turning a solar energy collector about the polar axis between at least two positions so that the frontal face of the collector at each position is directed approximately towards the sun as the sun tracks from east to west each day, comprising:

axle means upon which the collector is mounted free to rotate thereabout with the frontal face directed skyward, said axle means being aligned coplanar with the earth's polar axis so that rotation of the collector thereabout is in an east-west direction, a frame, a first heat responsive element which with solar radiation incident thereupon assumes a first stable state, and fixed shadow means for shading said first element from the sun's radiant energy during a first period of the daylight hours and for allowing the sun's radiant energy to be incident upon said first element during a second period of the daylight hours, said first element being responsive to being shaded by said shadow means to assume a second stable state, said first element being so coupled to the collector and said frame that in response to said first element being in said first state due to being radiated by said sun during said second period, the collector is rotated about said axle means to assume a first position whereby the collector's frontal face is approximately directed towards the sun during said second period, and that in response to said first element being in said second state due to being shaded from the sun by said shadow means during said first period the collector is rotated about said axle means to assume a second position whereby the collector's frontal face is approximately directed towards the sun during said first period.

3,982,527
METHOD AND APPARATUS FOR CONCENTRATING, HARVESTING AND STORING OF SOLAR ENERGY

Chen-yen Cheng, 9605 La Playa St. NE., Albuquerque, N. Mex. 87111, and Sing-Wang Cheng, No. 1, Lane No. 479, Fu-shing No. Road, Taipei, China /Taiwan

Filed Jan. 2, 1974, Ser. No. 429,500
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **15 Claims**



1. A panel collector for intercepting and concentrating solar rays and harvesting the energy of the solar rays as thermal energy comprising of an integrated reflector-heat sink-heat transfer surface panel having a front side and a back side which comprises:

(i). plurality of focusing reflectors, each having a focus with a relatively short focal length, for reflecting and converging the intercepted solar rays into sets of converging rays directed toward the respective foci; the reflector surfaces facing the front side of the integrated panel and existing within a zone, denoted as the reflector zone, which is within a certain depth from a reference plane that touches the front side of the integrated panel, the reflector surfaces dividing the panel into a bright region and a shadow region, which are respectively the region in front of, and the region behind the reflector surfaces with respect to the direction of solar rays falling perpendicular to the front side of the integrated panel,

(ii). plurality of heat sinks placed close to the foci of the focusing reflectors for intercepting the sets of solar rays reflected and converged by the focusing reflectors, absorbing the energy of the rays and converting it solely into thermal energy therein;

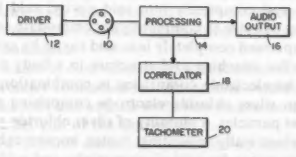
(iii). at least a heat transfer surface that is located in the shadow region of the panel and is in contact with a heat absorbing medium, at least a major part of the heat transfer surface being located away from the immediate vicinity of any of the heat sinks; and

(iv). means constructed of a metal for conductively transmitting the thermal energy generated in the heat sinks to the heat transfer surface to thereby transmit the thermal energy to the heat absorbing medium.

3,982,528
APPARATUS FOR REFINING SIGNALS DERIVED FROM FETAL HEARTBEATS

Patrick G. Phillipps, Newton, Mass., assignor to Brattle Instrument Corporation, Cambridge, Mass.

Filed Feb. 24, 1975, Ser. No. 552,233
Int. Cl.² A61B *5/02*
U.S. Cl. 128—2.05 T **15 Claims**



1. A device for providing a periodic electrical output derived from fetal heartbeats, comprising

a transducer for converting mechanical energy impressed with the fetal heart cycle into a raw electrical signal including energy carrying information related to said cycle,

signal processing circuitry means connected to said transducer to convert said information-carrying energy into a refined electrical signal,

correlation circuitry means connected to said signal processing circuitry means including first means for storing portions of said refined signal corresponding to successive current fetal heart cycles and second means for forming and storing a sample signal derived from portions of said refined signal corresponding to one or more previous fetal heart cycles, and third means for forming the correlation function in time between the signals stored in said first and second means, and

output circuitry means for detecting successive peaks of said correlation function corresponding to successive fetal heart cycles and providing an output signal based upon the occurrences of said peaks,

said output circuitry means including peak detector means for comparing the value of said correlation function to a reference related to the value of the most recently detected peak of said function, and delay means for providing said output signal only after a peak-free delay of predetermined length following the detection of a peak of said correlation function.

3,982,529

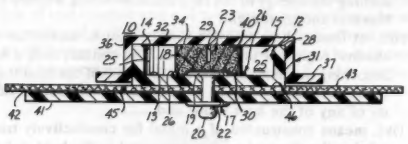
BIOELECTRODES

Takuya R. Sato, 5130 Randall St., Culver City, Calif. 90230

Continuation-in-part of Ser. No. 483,181, June 25, 1974, abandoned, and a continuation-in-part of Ser. No. 492,367, July 29, 1974, abandoned, which is a continuation-in-part of Ser. No. 228,827, Feb. 24, 1972, Pat. No. 3,834,373. This application Aug. 7, 1975, Ser. No. 602,611

Int. Cl.² A61B 5/04

U.S. Cl. 2.06 E **41 Claims**



1. A bioelectrode applicable to a body part, comprising in combination:

an electrically insulating structure having a bottom portion and a lateral wall portion defining a cavity;

electric current conducting means including and electrode at said bottom portion;

means for retaining electrolyte, including a pad of electrolyte-absorbent resilient material in said cavity contacting said electrode at said bottom portion and projecting out of said cavity in an electrolyte containing relaxed condition;

a lateral space between said pad and said wall portion;

a removable cover on said structure compressing said resilient pad completely into said cavity, said lateral space being of a size to completely accommodate said pad when compressed completely into said cavity by said cover; and

means for attaching said structure to a body part.

28. A bioelectrode comprising in combination:

a silver, silver chloride electrode comprising a plurality of silver particles, a plurality of silver chloride particles, and an electrically insulating, water impermeable, inert organic matrix for said silver particles and said silver chloride particles, said silver particles and said silver chloride particles being interspersed with each other in and throughout said matrix, and said interspersed silver particles and silver chloride particles being in electrical contact with each other;

an electrical conductor connected to said silver, silver chloride electrode;

means for retaining an electrolyte at said silver, silver chloride electrode;

container means for said silver, silver chloride electrode and for at least part of said conductor and said electrolyte-retaining means;

an adhesive between said electrolyte retaining means and said container means, said adhesive being independent of said matrix and anchoring said electrolyte retaining means in said container means;

said silver particles being present in said organic matrix in an amount of from 15 to 70% by volume of said organic matrix with said interspersed silver particles and silver chloride particles;

said silver chloride particles being present in said organic matrix in an amount of from 0.2% to 15% by volume of said organic matrix with said interspersed silver particles and silver chloride particles; and

said organic matrix constituting essentially the balance of the volume of said organic matrix with said interspersed silver particles and silver chloride particles.

3,982,530

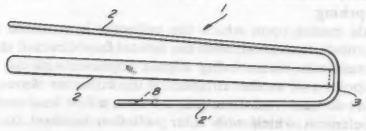
PENIAL APPLIANCE

Egon Storch, 98-19 64th Ave., Forest Hills, N.Y. 11374

Filed Apr. 22, 1975, Ser. No. 570,527

Int. Cl.² A61F 5/00

U.S. Cl. 128—79 **7 Claims**



1. A penial appliance for use in connection with the male organ of a person comprising, in combination:

a base:

a plurality of spaced apart elongated members extending from said base and defining an enclosure adapted to engage said male organ with the tips of said members engaging the body of said person;

said enclosure having a length at least as long as said male organ:

said base forming a barrier to said male organ; and

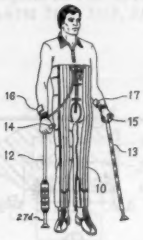
abutment means connected to the tips of said members against the body of said person is substantially non-irritating.

3,982,531

INFLATION DEVICE FOR A PNEUMATIC ORTHOSIS

Donald E. Shaffer, Newark, Del., assignor to Thiokol Corporation, Newtown, Pa.

Filed Apr. 30, 1975, Ser. No. 572,980
Int. Cl.² A61H 1/00
U.S. Cl. 128—24 R 14 Claims



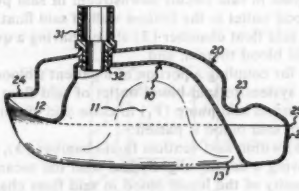
1. An inflatable orthosis system comprising, in combination, a cane, a gas generator in said cane, means for initiating the generation of gas by said generator, and conduit means communicably connected to the gas generator and to the inflatable orthosis to conduct the generated gas thereto.

3,982,532

BREATHING MASK, PARTICULARLY FOR ARTIFICIAL RESPIRATION

Matts Arne Bernhard Halldin, Lidingo, and Nils Rune Gustaf Andréasson, Stockholm, both of Sweden, assignors to Gnosjoplast AB, Gnosjo, Sweden

Filed Dec. 17, 1974, Ser. No. 533,497
Claims priority, application Sweden, Dec. 19, 1973, 7317152
Int. Cl.² A62B 18/02
U.S. Cl. 128—146 2 Claims



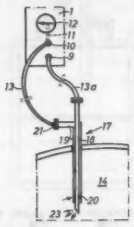
1. An integral breathing mask, particularly for artifical respiration, comprising an inner and outer wall of resilient material, the circumferential edges of said walls being connected to define a cup-shaped face mask having a variable volume internal air space therebetween and generally designed to surround the nose and mouth of the patient in a sealing manner, said outer wall being provided with a continuously open vent for venting the internal air space between the inner and outer resilient walls to the atmosphere, said inner and outer walls being connected at a point removed from the circumferential edges thereof to provide a tubular passage for admitting a breathing gas to the inside of the mask, said resilient outer wall being provided with a circumferential wall portion extending substantially perpendicular to the surface of the patient's face, and deformable resilient sealing pads formed on the inside of the inner wall for pressing against the sides of the nose and adjoining cheek portions of the patient, said inner wall having a rigid arcuate portion adjacent its circumference for pressing against the chin area of the patient, and said outer wall having opposed reinforced portions adjacent the circumferential wall portion for gripping and handling the mask.

3,982,533

INSUFFLATION APPARATUS

Peter P. Wiest, Berlin, Germany, assignor to F. M. Wiest KG, Germany

Filed Aug. 27, 1975, Ser. No. 608,163
Claims priority, application Germany, Mar. 14, 1975, 7508556[U]
Int. Cl.² A61M 13/00
U.S. Cl. 128—184 7 Claims



1. In an insufflation apparatus, including means for introducing limited quantities of carbon dioxide into the human body for operational purposes, particularly for laparoscopy, and further including a control device for delivering the carbon dioxide having a first outlet connection nipple, a Veress needle, a first flexible tubing connected at one end to said Veress needle introduceable into a body cavity and at the opposite end to said first nipple, and a pressure gauge for indicating the pressure in the body cavity, the improvement comprising, in combination, a second connection nipple on said control device; a pipe connecting said pressure gauge to said second connection needle; a second flexible tubing connected at one end to said second connection nipple, means connected to the opposite end of said second tubing introduceable into said body cavity and adapted to be spaced from the tip of said Veress needle for detecting pressure within said body cavity, and means selectively operable to interconnect said first and second nipples.

3,982,534

INTRAVENOUS ADMINISTRATION SYSTEM

Thomas P. Buckman, 11561 Shelly Vista Drive, Tujunga, Calif. 91042

Filed Jan. 10, 1975, Ser. No. 539,953
Int. Cl.² A61M 5/16
U.S. Cl. 128—214 C 23 Claims

1. An intravenous administration system having a plurality of connected intravenous units operating in a cooperative and inter-related manner to provide controlled administration of several parenteral fluids through a single cannula said system comprising:

1. a primary intravenous set including
   a. spike means adapted to connect the set to a container of intravenous fluid, conduit means connected to said spike means for conducting fluid from the intravenous fluid container,
   b. vent means in communication with the conduit means,
   c. a flowmeter connected to the aforesaid conduit means,
   d. anti-air lock and anti-air embolism means connected to the outlet end of the flowmeter,
   e. a flow control assembly connected to the aforesaid anti-air lock and anti-air embolism means, and adaptive means positioned ahead of the flowmeter for receiving the fluid connector of a secondary IV, said means incorporating a check valve for prevention of fluid flow

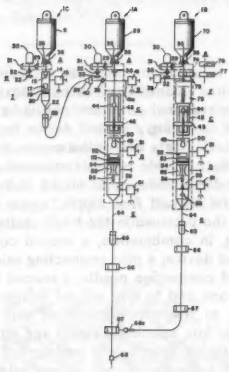
from a primary IV container to a secondary, and a second check valve for prevention of fluid flow from a secondary to the primary,

f. a fluid reservoir and administration assembly in communication with the flow control assembly for administering the intravenous fluid to the patient,

2. a volumetric intravenous set including

a. spike means adapted to connect the set to a container of intravenous fluid, conduit means connected to said spike, means for conducting intravenous fluid from the intravenous fluid container,

b. a valve controlling flow through the conduit means, a vent valve in communication with the conduit means, a volumetric reservoir connected to the aforesaid conduit means,



c. a flow meter connected fluidly to the aforesaid volumetric reservoir,

d. a flow control assembly connected to the flow meter, and

e. a fluid reservoir and administration assembly connected at one end to the flow control assembly and at the other end to the administration assembly of the primary set, and

3. a secondary intravenous set including

a. spike means adapted to connect the set to a container of intravenous fluid, conduit means connected to said spike, means for conducting intravenous fluid from the intravenous fluid container,

b. anti-air lock and anti-air embolism means connected to the aforesaid conduit means, and

c. administration means connected to the anti-air lock and anti-air emolism means, said administration means including a cannula fluidly connected to the primary set above the flow meter whereby intravenous fluid from the secondary set is fed into the primary set for administration thereby.

3,982,535

SIGNAL DEVICE FOR DIALYSIS APPARATUS

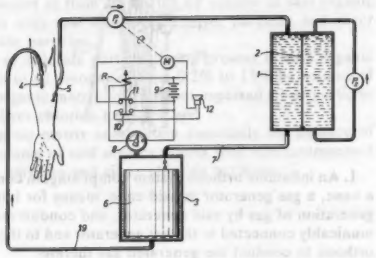
Per Svante Bahrton, Lojovagen 19, S-181 47 Lidingo, Sweden

Filed Mar. 4, 1975, Ser. No. 555,192

Claims priority, application Sweden, Mar. 15, 1974, 7403545

Int. Cl.[2] A61M 1/03

U.S. Cl. 128—214 E **7 Claims**



1. A dialysis apparatus, such as an artificial kidney, comprising:

a circuit through which liquid blood is passed, said circuit including:

a pump (P_1) coupled in said circuit for transporting blood through said circuit;

a ventless float chamber (3) having an inlet at the upper portion thereof for receiving liquid blood and which is coupled in said circuit downstream of said pump, and a blood outlet in the bottom wall of said float chamber (3), said float chamber (3) always having a quantity of liquid blood therein; and

means for coupling a portion of a patient's blood circulation system to said blood outlet of said float chamber (3) and to said pump (P_1) to close said circuit through which said blood is passed;

a float (6) within said ventless float chamber (3), said float (6) having a density slightly less than the mean value of the density of the liquid blood in said float chamber (3) so that the major portion of said float (6) will normally remain submerged in the liquid blood within said float chamber (3), said float (6) having a lower surface which is arranged to at least substantially block said outlet of said float chamber to at least substantially interrupt the supply of blood from said outlet of said float chamber responsive to a lowering of said float in the blood in said float chamber caused by a predetermined increase of air pressure above the blood in said float chamber; and

an alarm signal device comprising:

detection means (8) coupled to said float chamber (3) for detecting a further predetermined increase in air pressure inside said float chamber (3) after a lowering of said float (6) which substantially blocks said blood outlet and which thereby substantially interrupts the blood supply to the patient's blood circulation system; and

electrical means (R, 9, 12) coupled to said detection means (8) for generating an alarm signal in response to said detection of said further predetermined increase in air pressure in said float chamber (3).

3,982,536

BALLISTIC INOCULATION OF ANIMALS AND PROJECTILE THEREFOR

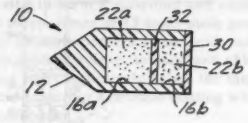
Gerald P. Krogseng, Oakdale, and Fred R. Paul, Jr., Burnsville, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 15, 1974, Ser. No. 524,121

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.[2] A61M *5/00, 5/18, 31/00*

U.S. Cl. 128—260 13 Claims



1. A ballistic implant shaped for penetrating the epidermal covering of a living animal body and lodging totally within the tissues of the animal body, the implant consisting essentially of a biologically compatible polymer body and an antigen contained within the polymer body in a manner permitting release of said antigen in response to the fluids and cells of the living animal body.

3,982,537

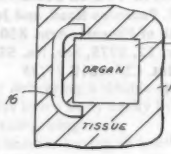
DYNAMIC IMPLANTS AND METHOD FOR IMPLANTING THE SAME

Louis Bucalo, 155 Roberts St., Holbrook, N.Y. 11741

Filed Dec. 30, 1974, Ser. No. 537,572

Int. Cl.[2] A61M *1/00, 31/00*

U.S. Cl. 128—260 6 Claims



1. Method of treating a living being over a prolonged period of time with an agent which affects the health of said living being by causing said agent to be slowly released during said period of time within internal tissue of said living being, which comprises implanting in liquid molten condition a depot of a substance which solidifies in the internal tissue of said living being and which is safely absorbable by said living being, said substance solidifying at the temperature of the body of said living being and being molten and liquid at a higher temperature at which it is implanted, the implanting temperature not adversely affecting the living being during the implanting, said substance having distributed therethrough said agent which affects the health of said living being so that as said substance is absorbed by the living being the agent is released within the internal tissue of said living being to act on its health.

3,982,538

SAFETY VALVES FOR PROTECTION AGAINST LIQUID CONTAMINATION

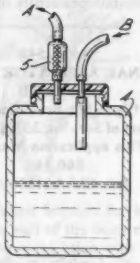
Anthony Nelson Sharpe, Aylmer, Canada, assignor to N.V. Internationale Octrooi Maatschappij "Octropa", Rotterdam, Netherlands

Filed July 8, 1974, Ser. No. 486,298

Claims priority, application United Kingdom, July 9, 1973, 32526/73

Int. Cl.[2] A61M *1/00*

U.S. Cl. 128—276 2 Claims



1. A safety valve for protection against fluid contamination comprising a hollow carrier adapted for insertion in a flow-line and containing a valve element consisting essentially of a granular or powdered gelling material which allows the flow through said carrier of gas in the absence of water, but which in the presence of water swells to block said carrier and prevent further flow, said gelling material being selected from the group consisting of gelatine, sodium alginate, agar, sodium carboxy methyl cellulose and swellable starch derivatives.

3,982,539

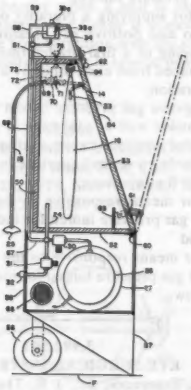
MEDICAL/SURGICAL SUCTION EQUIPMENT

Edward E. Muriot, Horsham, Pa., assignor to Health Technology Labs, Inc., Horsham, Pa.

Continuation of Ser. No. 497,838, Aug. 16, 1974, abandoned. This application Sept. 17, 1975, Ser. No. 614,226

Int. Cl.[2] A61M *1/00*

U.S. Cl. 128—276 17 Claims



1. Equipment for withdrawing body liquids comprising a vacuum chamber, a suction bag removably positioned in the vacuum chamber and having an opening for interconnecting the interior of the bag with the interior of the chamber, the bag further having an inlet connection comprising a tube the

wall of which is connected with the wall of the bag and extended therefrom to a point exterior of the vacuum chamber for intake of body liquid, a vacuum line adapted to be connected with a pressure reduction source of substantially constant reduced pressure, said line being connected with the vacuum chamber independently of the bag and being in communication with the interior of the vacuum chamber externally of the bag, and means for varying the pressure reduction in the vacuum chamber and thereby varying the suction in said bag comprising an adjustable bleed valve for introducing air into said line, the bag and tube being unitarily removable from the vacuum chamber independently of said vacuum line.

3,982,540

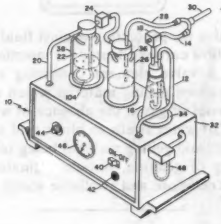
GASTROINTESTINAL ASPIRATOR PUMP SYSTEM AND METHOD

John R. Ross, 370 Clyde St., Brookline, Mass. 02167

Continuation-in-part of Ser. No. 333,871, Feb. 20, 1973, Pat. No. 3,885,567. This application Mar. 20, 1975, Ser. No. 560,161

Int. Cl.[2] A61M *1/00*

U.S. Cl. 128—278 **14 Claims**



1. An aspirator pump and tube system for draining liquid from a human cavity comprising:

a. a mulitlumen tube, a portion of which is adapted to be inserted into such cavity, having a positive gas pressure lumen and a negative gas pressure lumen, said lumens being separated from each other by a partition wall within said tube;

b. means for supplying negative pressure gas to said negative gas pressure lumen;

c. means for supplying a plurality of positive gas pressure pulses to said positive gas pressure lumen, each of said pulses being of a first predetermined time duration and being spaced from each other by a second predetermined time duration;

d. said negative gas pressure lumen having a first aperture in an outside wall of said tube in the portion adapted to be inserted into such cavity, and said positive gas pressure lumen having a second aperture in said portion wall adjacent said first aperture;

e. indicator means responsive to the flow of gas into said positive gas pressure lumen for indicating the rate of said flow, and

f. indicator means responsive to the flow of gas out of said negative gas pressure lumen for indicating the rate of said latter flow.

3,982,541

EYE SURGICAL INSTRUMENT

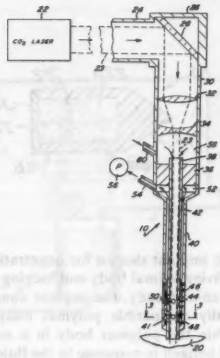
Francis A. L'Esperance, Jr., 1 E. 71st St., New York, N.Y. 10021

Filed July 29, 1974, Ser. No. 492,575

Int. Cl.[2] A61B *17/36*; A61M *7/00*

U.S. Cl. 128—303.1 **17 Claims**

1. A method of surgically removing body tissue comprising the steps of contacting the body tissue with a probe open at a free end, passing a laser beam through a central passage in said probe and said open end to said tissue at a power level to effect vaporization of tissue, vaporizing only the surface portion of said tissue exposed to said laser beam in a manner so that said vaporizing step is surface phenomena at a depth not more than about one third millimeter, introducing a gas stream into the probe downstream from lenses associated with the laser beam, passing said gas stream through said probe in



a direction towards said free end of said probe and out of said probe, and removing smoke and any vaporized portions of said tissue through said probe by way of said gas stream.

3,982,542

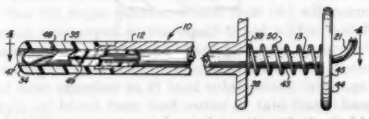
ELECTRORESECTROSCOPE AND METHOD OF LAPAROSCOPIC TUBAL STERILIZATION

John L. Ford, 4651 E. Palomino Road, and John Serafin, 4120 E. Earll Drive, both of Phoenix, Ariz. 85018

Filed Mar. 12, 1975, Ser. No. 557,469

Int. Cl.[2] A61B *17/38*

U.S. Cl. 128—303.14 **5 Claims**



1. A resectroscope adapted for use during laparoscopic sterilization of a Fallopian tube, said resectroscope comprising:

a. an elongate tubular sheath having forward and rearward opening ends, at least the forward end thereof being electrically insulative;

b. grasping means slidably carried within said tubular sheath for extending from the forward end thereof to engage a Fallopian tube and retract a section thereof within the interior of the forward end of said sheath; and

c. means for subjecting said section of said Fallopian tube located interior of said forward opening to conditions sufficient for electroresection and electrocoagulation.

3,982,543

REDUCING CAPILLARITY OF POLYGLYCOLIC ACID SUTURES

Edward Emil Schmitt, and Martin Epstein, both of Norwalk, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 354,043, April 24, 1973, Pat. No. 3,867,190, which is a continuation-in-part of Ser. No. 190,290, Oct. 18, 1971, Pat. No. 3,736,646. This application July 16, 1974, Ser. No. 489,004

Int. Cl.² A61L 17/00

U.S. Cl. 128—335.5 4 Claims

1. A surgical element comprising at least one strand of polyglycolic acid insoluble in each of xylene, toluene and chloroform having thereon a stiffening and capillarity reducing quantity of a copolymer of 15 to 85 mole percent glycolic acid and 85 to 15 mole percent lactic acid, said copolymer being soluble in each of xylene, toluene and chloroform, and having a melting point sufficiently below the melting point of polyglycolic acid to permit extrusion coating without melting of the polyglycolic acid.

3,982,544

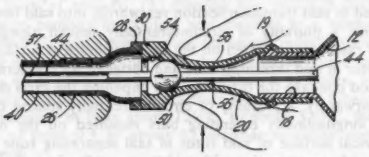
DEVICE FOR EVERTING A PROBE INTO A BODY CAVITY

Manfred Dyck, Somerville, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Nov. 18, 1974, Ser. No. 524,610

Int. Cl.² A61M 25/00

U.S. Cl. 128—349 R 8 Claims



1. A device for delivering a double-walled probe having a pressurized annulus into a body cavity by the method of eversion, said device comprising:

a pressurizing chamber having an inlet port for introducing a pressurizing fluid therein;

an adapter having an axial bore therethrough, said adapter having proximal and distal ends and a resilient intermediate portion of a sufficient length to permit flexing and said adapter being removably attached at its proximal end to said pressurizing chamber;

an eversible tube having a closed and an open end, said open end being sealed to the distal end of said adapter bore precluding the unrestricted flow of pressurizing fluid from said chamber out of said adapter, the remainder of said tube extending through said adapter bore and into said chamber;

valve means carried on said tube near said closed end thereof; and

means in said adapter adjacent its distal end for seating said valve means to seal said pressurized annulus after said tube has been everted through said adapter, whereby when said resilient intermediate portion of said adapter is flexed said adapter bore is reduced in size thereby urging said valve means into said seating means.

3,982,545

MIDDLE EAR AERATION AND IMPLANT

Herbert Silverstein, 269 Barwynne, Wynnwood, Pa.

Continuation of Ser. No. 499,630, Aug. 22, 1974, abandoned, which is a continuation of Ser. No. 354,523, April 26, 1973, abandoned, which is a continuation of Ser. No. 118,275, Feb. 24, 1971, abandoned. This application Oct. 24, 1975, Ser. No. 625,957

Int. Cl.² A61M 27/00; A61F 11/00

U.S. Cl. 128—350 R 4 Claims

1. A middle ear aeration implant for insertion through a hole drilled through the wall of the bony external canal in an area in which it is in communication with the middle ear and of a diameter in the order of 1.5 mm in diameter, said implant being of a resiliently yieldable inert elastomeric material having the characteristics of silicone rubber and comprising a tubular portion of a length substantially greater than the axial extent of the hole and of an outside diameter such as to be a snug fit in said hole and a flange at the posterior end of the tubular portion that is of a diameter in the neighborhood of 3.5 mm and in a plane at right angles to the axis thereof, the thickness of the flange and of the wall of the tubular portion being in the order of 0.25 mm thereby to enable the flange to be collapsed against the tubular portion and the length of the tubular portion being in the order of 1.5 cm. thereby to enable the flange to be collapsed against the tubular portion and the length of the tubular portion against which the flange is collapsed itself so collapsed that the thus collapsed part of the implant is of a cross sectional size and shape so closely approximating said outside diameter and also sufficiently stiff that it may be forced through said hole without damaging the bony structure with the anterior end of the implant protruding outwardly and with the resiliency of the material restoring the flange to its normal position, once the collapsed flange clears the bony structure, whereby when a pull is exerted at the anterior end of the implant, the flange is seated against the posterior surface of the bony structure with the snug fit of the tubular portion frictionally holding it against posterior movement.

3,982,546

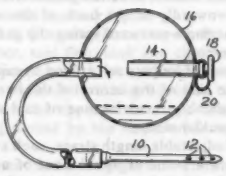
DEVICE FOR DRAINING A BODY CAVITY

John H. Friend, 10200 Arno Road, Galt, Calif. 95632

Filed Feb. 28, 1975, Ser. No. 554,173

Int. Cl.² A61M 27/00

U.S. Cl. 128—350 R 16 Claims



1. In a device for use with drainage means to carry out a procedure that includes withdrawing fluid from a cavity in the body of a patient, the combination of:

an intake tube for insertion into the cavity having coupling means at its outer end;

means including an outlet tube for cooperation with the intake tube to form a passage means from the intake tube for the drainage fluid,

said outlet tube having an outlet port at the outer end thereof for release of the drainage fluid and coupling means at its other end for cooperating with said intake tube coupling means;

means for opening and closing said outlet port; and

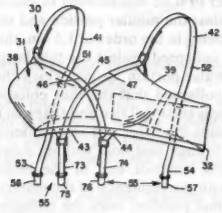
a reservoir means encompassing said coupling means, said passage means being designed so that it can be opened by actuation of said coupling means, and said reservoir means being in communication with said passage means to receive fluid from the intake tube when the outlet port is closed and said coupling means are actuated to open said passage means.

3,982,547

SKIRT, OR SLACKS SUPPORTING BRASSIERE

Amy Thelma Walker, 5422 Hawthorne Place, Washington, D.C. 20016

Filed June 11, 1975, Ser. No. 586,022
Int. Cl.[2] A41C *3/00*
U.S. Cl. 128—452 5 Claims



1. In combination

a brassiere having a lower chest band adapted to encompass the chest of the wearer; a body portion with a pair of bust cups extending upwardly from said lower chest band, the opposite ends of said band having fastening means at the rear of said chest,

a pair of shoulder straps, each extending upwardly, from a point of attachment to said chest band under one said cup, diagonally along the upper edge of the other said bust cup and thence over the shoulder of a wearer and thence downwardly of the back of the wearer to waist level and having a rearward spring clip at the lower terminal end thereof;

at least one pair of loops, each affixed to said chest band on an opposite side of the centre of the back of said chest band and slidably receiving one of said downwardly extending shoulder straps;

and a pair of adjustable length straps, each extending downwardly from a point of attachment of a shoulder strap with said chest band to waist level and having a forward spring clip at the lower terminal end thereof,

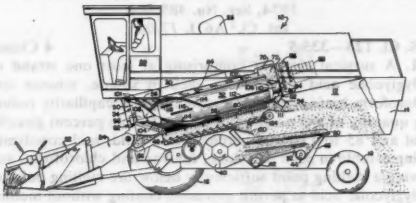
said rearward and forward clips being adapted to engage and support the waist band of a lower garment of the skirt, or slack, type.

3,982,548

HELICAL ELEMENT ROTOR-AXIAL FLOW COMBINE

Tom G. Stamp, Davenport, Iowa, and Neil C. Dunn, Moline, Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Aug. 28, 1975, Ser. No. 608,603
Int. Cl.[2] A01F *12/20*
U.S. Cl. 130—27 T 12 Claims



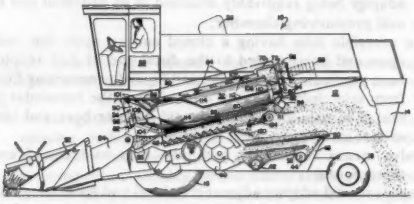
1. In an axial flow-type combine, in combination, an elongated generally cylindrical rotor casing having a concave establishing a forward threshing zone, and a grate establishing a rearward separating zone, the forward end of said threshing zone being provided with a forwardly and outwardly flared funnel-like frusto-conical transition section designed for reception of crop material, a series of spaced apart spiral transport fins fixedly secured to the upper region of said rotor casing internally thereof, a generally cylindrical imperforate tubular rotor mounted for rotation within said casing in coaxial relationship and substantially coextensive therewith, a vaned impeller on the forward end of said rotor within the frusto-conical transition section having vanes which sweep around the inner surface of said transition section in coextensive close proximity thereto for moving the crop material received in said transition section rearwardly into said threshing zone, a plurality of circumferentially spaced elongated helical rasp bars mounted on the outer cylindrical surface of said rotor in said threshing zone and designed for cooperation with said concave for threshing and impelling the crop material rearwardly, a plurality of circumferentially spaced elongated longitudinally extending bars mounted on the outer cylindrical surface of said rotor in said separating zone and designed for cooperation with said transport fins in such zone, first relatively short longitudinally extending rasp bars mounted on the outer cylindrical surface of the rotor within said threshing zone and means for driving said rotor.

3,982,549

HELICAL ELEMENT ROTOR-AXIAL FLOW COMBINE

Richard A. De Pauw, East Moline, and David J. Gustafson, Geneseo, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Aug. 28, 1975, Ser. No. 608,602
Int. Cl.[2] A01F *12/20*
U.S. Cl. 130—27 T 13 Claims



1. In an axial flow-type combine, in combination, an elongated generally cylindrical open-ended rotor casing having a concave establishing a forward threshing zone, and a grate

establishing a rearward separating zone, the forward open end of said casing being designed for reception of crop material, a series of spaced apart spiral transport fins fixedly secured to the upper region of said rotor casing internally thereof, a rotor of a generally cylindrical imperforate tubular construction mounted for rotation within said casing in coaxial relationship and substantially co-extensive therewith, a plurality of circumferentially spaced elongated helical transport rasp bars mounted on the cylindrical peripheral region of said rotor in said threshing zone and designed for cooperation with said concave in such zone for threshing and impelling the crop material rearwardly, a plurality of circumferentially spaced elongated longitudinally extending bars mounted on the cylindrical peripheral region of said rotor in the separating zone and designed for cooperation with the transport fins for impelling the crop material rearwardly, and means for driving said rotor.

3,982,550
PROCESS FOR EXPANDING TOBACCO

Roger Z. de la Burde, Powhatan; Patrick E. Aument, Hopewell, both of Va.; Ray F. Dawson, Princeton, N.J., and Ronald A. Tamol, Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

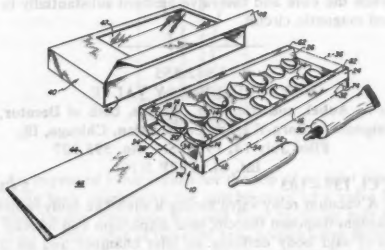
Filed June 5, 1975, Ser. No. 583,888
Int. Cl.² A24B *3/18*
U.S. Cl. 131—140 P **1 Claim**

1. A process for expanding tobacco which comprises the steps of (1) subjecting tobacco to a vacuum of from about 15 to about 30 inches of mercury, (2) contacting the tobacco, while it is maintained under a vacuum of from about 15 to about 30 inches of mercury and a temperature of from about 0°C. to about 80°C., with a water spray to impregnate the tobacco with water to provide a tobacco product having a moisture content of from about 100 to 400 parts by weight per 100 parts of tobacco, (3) freezing said moisture-containing tobacco product by cooling said product to a temperature below 0°C., while maintaining the same under a vacuum of from about 15 to about 30 inches of mercury until substantially all of the moisture contained therein is frozen, and (4) rapidly heating the frozen moisture-impregnated tobacco at a temperature of from about 120°C. to about 320°C. for a period of from 0.5 to about 12 seconds to cause expansion thereof.

3,982,551
FALSE FINGERNAIL KIT

Edgar O. Bartolucci, Tuxedo Park, N.Y., assignor to Instore Advertising, Inc., Passaic, N.J.

Filed May 27, 1975, Ser. No. 580,591
Int. Cl.² A45D *29/00*
U.S. Cl. 132—73 **3 Claims**

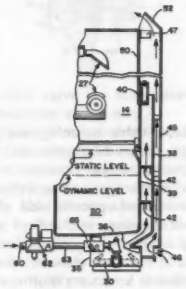


1. In a false fingernail kit, the improvement comprising:
a unitary structure including
a plurality of false fingernail blanks; and
a frame unitary with each of the false fingernail blanks, said frame including basal surfaces for resting the frame upon a support surface;
each false fingernail blank being interconnected with the frame at a limited portion of the blank, said limited portion being small enough to enable the blank to be torn manually from the frame without mutilation of the blanks;
the frame including a pair of longitudinally extending rails spaced laterally from one another and joined together by an interconnecting web;
the blanks extending laterally from each rail toward the other rail and being spaced altitudinally from the web;
said basal surfaces being spaced from said blanks in opposite altitudinal directions therefrom such that the frame is capable of resting upon the support surface in either of two positions, one of which positions is inverted relative to the other.

3,982,552
THERMAL PROTECTION FOR DISHWASHING MACHINE

Louis F. Fraula, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed June 26, 1975, Ser. No. 590,431
Int. Cl.² B08B *3/02*
U.S. Cl. 134—57 D **3 Claims**



1. In a dishwashing machine having a housing defining a washing chamber including a tank for holding a quantity of washing liquid, means for supporting soiled articles in said chamber above said tank, a spray device for expelling the liquid over the articles,
a motor driven pump connected to force the liquid from said tank through said spray device to cleanse the articles and to carry soil from the articles with liquid falling back into said tank,
a control circuit connected for selective operation of said motor driven pump,
a gas-fired heater arranged in direct heat exchange with said tank to heat the washing liquid,
a flue extending from said heater upwardly along said tank and chamber, said flue, tank and chamber having common wall portions in heat exchange relation with flue gases on one side and washing liquid on the inner side of said chamber, the upper parts of said common wall portions being wetted by the liquid when said pump is in operation;
the improvement comprising gas flow control means incorporated in said gas supply and operative to meter gas flow between at least a higher normal heating rate and a substantially lower standby rate,
and said control circuit having a connection to control said gas flow control means operative to reduce the gas supply

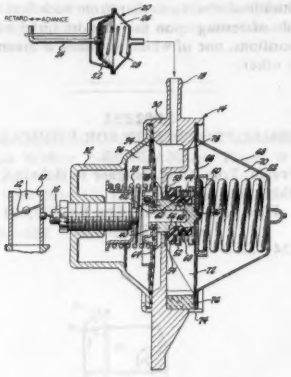
automatically to the standby rate at the same time said pump is not operated by said control circuit.

3,982,553

VACUUM REDUCER VALVE ASSEMBLY

Daniel U. Johnston, and Robert L. Larson, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 28, 1975, Ser. No. 635,862
Int. Cl.² F02P 5/14
U.S. Cl. 137—81 3 Claims



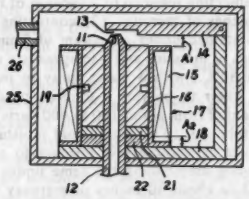
2. A vacuum reducer valve assembly comprising a housing, a cover, a diaphragm secured between said housing and said cover to define a source vacuum chamber between said cover and one side of said diaphragm and to define a reduced vacuum chamber between the opposite side of said diaphragm and one side of said housing, said source vacuum chamber having an opening adapted for connection to a source of vacuum, said reduced vacuum chamber having an opening adapted for connection to a vacuum motor, a closure member, a pressure responsive member secured between said closure member and said housing to define an atmospheric pressure chamber between the opposite side of said housing and one side of said pressure responsive member and an evacuated chamber between the opposite side of said pressure responsive member and said closure member, said housing having an aperture leading to said reduced vacuum chamber from said atmospheric pressure chamber, the opposite side of said housing defining a valve seat surrounding said aperture, a plunger extending through said aperture and having one end secured to said diaphragm and the opposite end engaging said pressure responsive member, a cylindrical axially-flexible seal disposed about said plunger and having one end secured to the opposite end of said plunger, said plunger having a valve seat formed thereabout intermediate its ends and further having a port intermediate said plunger valve seat and the opposite end of said plunger and a passage extending from said port to said source vacuum chamber, the other end of said seal having inner and outer valve surfaces biased toward engagement with said plunger valve seat and said housing valve seat respectively, said diaphragm being biased toward said housing to thereby maintain the pressure in said reduced vacuum chamber at a predetermined differential greater than the pressure in said source vacuum chamber, whereby when the pressure in said reduced vacuum chamber exceeds the pressure in said source vacuum chamber by an amount greater than said differential said operating diaphragm moves said plunger to engage said outer valve surface with said housing valve seat and disengage said inner valve surface from said plunger valve seat to thereby connect said reduced vacuum chamber through said aperture, said port and said passage to said source vacuum chamber and thus reduce the pressure in said reduced vacuum chamber, whereby when the pressure in said reduced vacuum chamber is less than the pressure in said source vacuum chamber plus said differential said operating diaphragm moves said plunger to disengage said outer valve surface from said housing valve seat and engage said inner valve surface with said plunger valve seat to thereby connect said reduced vacuum chamber through said aperture to said atmospheric pressure chamber and thus increase the pressure in said reduced vacuum chamber, and whereby said pressure responsive member controls the bias of said diaphragm toward said housing in accordance with the pressure in said atmospheric pressure chamber and thus varies said differential in accordance with atmospheric pressure.

3,982,554

ELECTROMAGNETIC FLAPPER VALVE

Shinji Saito, Yokohama, and Masao Suzuki, Kawasaki, both of Japan, assignors to Tokyo Keiki Company Limited, Tokyo, Japan

Filed Apr. 17, 1975, Ser. No. 569,085
Claims priority, application Japan, Apr. 25, 1974, 49-46491[U]
Int. Cl.² F16K 31/06
U.S. Cl. 137—82 9 Claims



1. An electromagnetic flapper valve having a fluid discharge orifice, a ferromagnetic valve element for movably controlling fluid flow through the orifice, an electromagnet arranged to controllably move said valve element and comprising a core and an electric coil wound around said core, and a ferromagnetic support member supporting said valve element and said electromagnet so that said valve element, said support member and said core of the electromagnet are arranged in a substantially closed magnetic circuit, a ferromagnetic spacer and a paramagnetic spacer, said spacers being mounted in series between the core and the support member in substantially said closed magnetic circuit, the combined thickness of said spacers having a predetermined value and the thickness of the paramagnetic spacer comprising a predetermined gap between the core and the valve element substantially in said closed magnetic circuit.

3,982,555

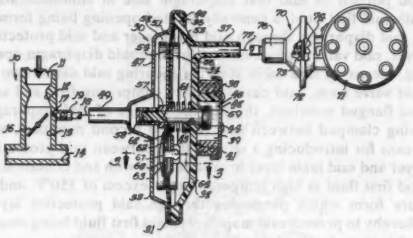
VACUUM RELAY VALVE

John A. Aubel, and Ronald E. Reinke, both of Decatur, Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed July 14, 1975, Ser. No. 595,907
Int. Cl.² F02P 5/10
U.S. Cl. 137—103 3 Claims

1. A vacuum relay valve having a shell-like body, a flexible diaphragm disposed therein, said diaphragm and interior portions of said body defining an inlet chamber and an outlet chamber, said inlet chamber communicating with an inlet port adapted for connection to a vacuum signal source, said outlet chamber communicating with an outlet port adapted for connection to a vacuum operated device, wherein the improvement comprises one-way check valve means arranged to con-

trol flow between said outlet chamber and said inlet chamber, said check valve means closing in response to a positive-going pressure change in said inlet chamber and opening in response to a negative-going pressure change in said inlet chamber to permit flow from said outlet chamber toward said inlet chamber, an atmospheric bleed valve operably connected to said diaphragm arranged to control flow from atmosphere toward said outlet chamber, said bleed valve closing in response to a negative-going pressure change in said inlet chamber and



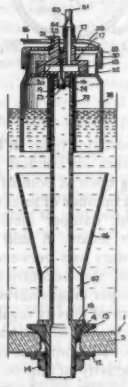
opening in response to a positive-going pressure change in said inlet chamber providing infusion of atmosphere into said outlet chamber in response to said positive-going pressure change in said inlet chamber, and a flow restrictor arranged in series circuit between said check valve means and said outlet chamber, said flow restrictor being protected from contaminating communication with said inlet chamber by said check valve means and being purged by flow from said outlet chamber in response to negative-going pressure change in said inlet chamber.

3,982,556

TANK FLUSHING MEANS

Vernon D. Roosa, 184 Wood Pond Road, West Hartford, Conn. 06107

Filed Sept. 26, 1974, Ser. No. 509,648
Int. Cl.² F16K *31/18*
U.S. Cl. 137—432 **8 Claims**



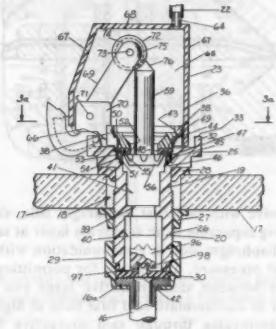
1. An improved valve means for the top of an inlet pipe for a flushing tank comprising the combination of a valve body mounted on the pipe top, a liquid flow cavity in said body including a valve seat at the pipe top, a valve stem including a sealing portion for engaging said seat, means for movably mounting said stem in the valve body for motion in a downward direction to an open position against the force of liquid flowing through said pipe past said seat and for motion in an upward direction to a sealed position on said seat, a floatable stem moving member movably positioned on said valve body at the top of said inlet pipe for engaging and for moving said stem to its open position in said downward direction only, and a second member pivotally mounted on said valve body for engaging the top of said stem moving member for moving it downwardly against said stem.

3,982,557

FLUID VALVE WITH FLOAT ACTUATOR

Ignacio Acevedo, 4066 Fenwick Road, Columbus, Ohio 43220

Continuation-in-part of Ser. No. 471,436, May 20, 1974, abandoned. This application Apr. 16, 1975, Ser. No. 567,253
Int. Cl.² E03D *1/33*; F16K *31/18*
U.S. Cl. 137—441 **10 Claims**



1. A fluid control valve for maintaining a predetermined fluid level in a reservoir comprising,

a valve body having a valve chamber with a fluid inlet and an upwardly opening fluid outlet, a valve sealing device disposed in circumscribing relationship to said outlet,

a valve closure element positioned in said valve chamber and normally held in closed relationship to said sealing device solely by fluid pressure in said valve chamber, said element movable into and out of fluid sealing engagement with said valve sealing device and having an elongated actuating stem rigidly secured thereto, said stem extending vertically upward through the outlet and projecting a distance outwardly from said valve body with the outer end portion convergently tapered, and

float actuating means including a lever arm pivotably mounted on said valve body for swinging movement relative thereto in a plane parallel to the longitudinal axis of said valve element, said lever arm having a cam follower contactingly engageable with said actuating stem in opening said valve and mounted to move onto the tapered end portion of said stem for increasing rate of movement in closing of said valve element, and a float attached thereto in spaced relationship to said cam follower and positionable within the fluid reservoir to respond to the fluid level therein for actuation of said valve closure element.

3,982,558

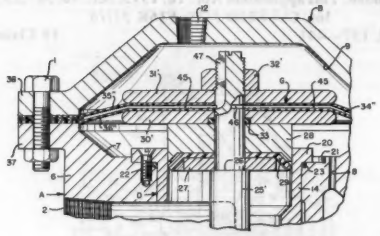
FLUID PRESSURE CONTROL VALVE

Paul Ochs, 2 Druid Hill Drive, Parsippany, N.J. 07054

Filed Apr. 18, 1969, Ser. No. 817,455
Int. Cl.² F16K *31/12*
U.S. Cl. 137—455 **1 Claim**

1. A fluid pressure operated control apparatus of the type having a casing with an inlet and an outlet for the flow of a first fluid under pressure, said casing having first and second flanged members, a diaphragm mounted in said casing, the peripheral edges of said diaphragm being clamped between said first and second flanged members, said diaphragm having

a first side and a second side, means placing a portion of said first diaphragm side in communication with fluid pressure in said inlet or outlet, means applying a regulating pressure on said second diaphragm side, and means actuated by said diaphragm in response to variations in differences of pressure on said first and second diaphragm sides for regulating said inlet or outlet fluid pressure, wherein the improvement comprises said diaphragm being flexible and having a main layer, and a protective layer permeable to said first fluid at high temperature, said main layer being incompatible with said first fluid at high temperature in pure form, said protective layer being at



least coextensive with said first diaphragm side, said protective layer being separable from said main layer at said portion of said first diaphragm side in communication with said inlet or outlet fluid preessure, and means for permitting a second fluid to enter between said protective layer and said main layer in order to contaminate said first fluid at high temperature which permeates through said protective layer, said means actuated by said diaphragm including a valve stem passing centrally through said diaphragm, said main layer slot extending outwardly from said valve stem and said stem having a passage for conducting a second fluid into said slot.

3,982,559

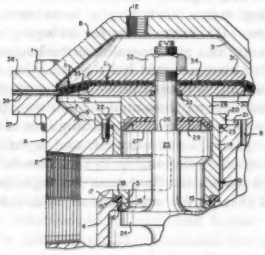
HIGH TEMPERATURE FLUID PRESSURE CONTROL VALVE

Paul Ochs, 2 Druid Hill Drive, Parsippany, N.J. 07054

Continuation of Ser. No. 817,455, April 18, 1969. This application Aug. 10, 1973, Ser. No. 387,324

Int. Cl.[2] F16K *31/12*

U.S. Cl. 137—455 **15 Claims**



1. A high temperature fluid pressure operated control apparatus for handling fluids in excess of 350°F. in temperature of the type having a casing with an inlet and an outlet for the flow of a first fluid under pressure and having a temperature in excess of 350°F., a diaphragm mounted in said casing, said diaphragm having a first side and a second side, means placing a portion of said first diaphragm side in communication with said first fluid in said inlet or outlet, means applying a regulating pressure on said second diaphragm side, and means actuated by said diaphragm in response to variations in differences of pressure on said first and second diaphragm sides for regulating said inlet or outlet fluid pressure, said regulating means including a valve stem, said diaphragm being flexible and having a main layer comprising an elastomeric material, and a protective layer permeable to and compatible with said first fluid at high temperature in excess of 350°F. in pure form, said main layer being incompatible with said first fluid at high temperatures in excess of 350°F. in pure form, said protective layer being at least coextensive with said first diaphragm side, said protective layer being separable from said main layer at said portion of said first diaphragm side in communication with said first fluid, a centrally located opening being formed in said diaphragm through said main layer and said protective layer, said valve stem extending through said diaphragm opening, means on said valve stem for securing said diaphragm to said valve stem, said casing further comprising first and second flanged members, the peripheral edge of said diaphragm being clamped between said first and second members, and means for introducing a second fluid between said protective layer and said main layer in order to mix with and contaminate said first fluid at high temperatures in excess of 350°F. and in pure form which permeates through said protective layer, whereby to protect said main layer, said first fluid being steam, and said protective layer being Teflon.

3,982,560

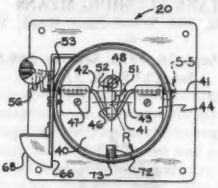
VENTILATING APPARATUS FOR HEAT TRANSFER SYSTEMS

Fred Dibert, 2617 Prospect St., Flint, Mich. 48504

Filed May 13, 1974, Ser. No. 469,072

Int. Cl.[2] F16K *15/00*

U.S. Cl. 137—527.8 **7 Claims**

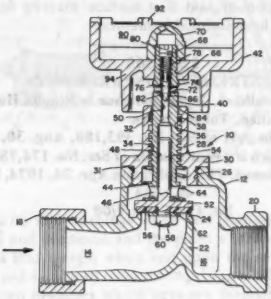


1. Apparatus for introducing fresh air to a forced air heating system comprising a fresh air conduit having a longitudinal axis, said conduit being open at both of its ends and adapted to occupy any one of a number of selected positions between vertical and horizontal; damper means; eccentric means mounting said damper means in said conduit for rocking movements about a rotary axis between conduit closed and conduit open positions, the eccentricity of said mounting means causing said damper means normally to seek a vertical position due to the force of gravity regardless of whether said conduit occupies a horizontal or vertical position; adjustable counterweight means of such mass as to be capable of overcoming the force of gravity acting on said damper means; means mounting said counterweight means on said damper means for movements of said counterweight means relative to said rotary axis to a selected one of a number of positions on opposite sides of said rotary axis and in any selected one of which positions said counterweight means exerts a force on said damper means to urge the latter in a direction toward its conduit closed position; and stop means responsive to movement of said damper means to its conduit closed position to prevent further movement of said damper means in said direction.

3,982,561
COMBINATION SURGE RELIEF AND BACK FLOW PREVENTION VALVE

Norman Edward Harthun, San Carlos, Calif., assignor to Telford Smith, Inc., San Carlos, Calif.

Filed July 17, 1975, Ser. No. 596,630
Int. Cl.² F16K 11/10
U.S. Cl. 137—596.2 6 Claims

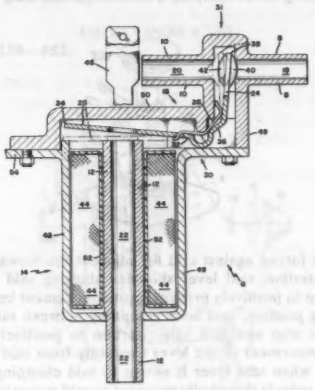


1. In a valve the combination of:
a hollow valve body divided by a wall into in-flow and out-flow chambers, there being a valve seat surrounding an opening in said wall communicating between said chambers;
internally threaded aperture means on said body concentric with said seat and communicating with said out-flow chamber;
a nipple means having an outer threaded portion which is screwed into said aperture means and an upwardly extending boss portion with an inner threaded portion;
a manually rotatable valve stem extending into said boss portion and having a threaded portion screwed into said inner threaded portion of said boss portion;
a valve head between said stem and said seat and movable by said stem against said seat to shut off said valve;
means extending from said valve head for guiding and maintaining said valve head in co-axial alignment with said stem and said seat, and permitting said head freedom to move toward and away from said seat when said stem is retracted from the valve closing position;
light spring means biasing said valve head towards said seat, said biasing action effectively closing said valve to prevent a reverse flow from said outflow chamber to said in-flow chamber but being ineffective to retard flow from said in-flow chamber to said out-flow chamber of water delivered to said in-flow chamber under normal domestic pressures;
said stem having a smooth cylindrical exterior portion extending upwardly from its said threaded stem portion and having a transverse relief passage;
a bore in said stem extending above said guiding means and communicating with said transverse passage;
a piston within said smooth bore of said stem;
a relatively heavy coil spring biasing said piston downward against the bottom of said bore and normally blocking said transverse passage;
a screw plug means making threaded engagement with said body to adjustably compress said spring against said piston;
whereby a surge of fluid pressure building up in said out-flow chamber will be applied to the inner end of said piston until the pressure of said piston against said piston biasing spring will compress the latter and lift the piston until said relief passage is opened allowing escape of fluid therethrough until said pressure surge subsides.

3,982,562
PRESSURE CONTROL APPARATUS

David A. Pickett, Warren, Mich., assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed Oct. 4, 1974, Ser. No. 512,801
Int. Cl.² F16K 31/10
U.S. Cl. 137—625.4 22 Claims



5. An electrically-operated, pressure control apparatus adapted to perform switching and actuating functions, said apparatus comprising:
a first pressure conduit having a first passageway extending between a point exterior of said apparatus and a point in the interior of said apparatus;
a second pressure conduit having a second passageway extending between a point exterior of said apparatus and a point in the interior of said apparatus;
a third pressure conduit having a third passageway extending between a point exterior of said apparatus and a point in the interior of said apparatus;
a coil assembly adapted to be energized electrically and exert a magnetic force, said coil assembly disposed within said apparatus; and an armature assembly having an actuated position and a non-actuated position and adapted to be operated electromagnetically when said coil assembly is energized, said armature assembly disposed adjacent to said coil assembly and acted upon directly by said coil assembly, said armature assembly having a sealing means disposed immediately adjacent to at least two of said passageways for directly contacting a portion of said at least two passageways to open said and close said at least two passageways.

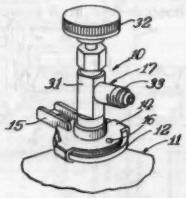
3,982,563
CLAMP-ON VALVE STRUCTURE

Leonard J. Kowal, Prospect Heights, and Robert C. Gibson, Chicago, both of Ill., assignors to Imperial-Eastman Corporation, Chicago, Ill.

Filed Jan. 2, 1974, Ser. No. 430,172
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976
Int. Cl.² B67B 7/24
U.S. Cl. 137—798 21 Claims

1. A clamp-on valve structure for use with a can of pressurized fluid having an annular, projecting lip encircling a connecting portion of the can, said valve structure comprising: a mounting plate having a central opening defined by an internally threaded, annular valve mounting portion, lug means defining first and second lip engagement portions equiangularly spaced from a diametric centerline bisecting said annular portion to extend rearwardly of a diameter of said annular portion perpendicular to said centerline, and means defining a stop; a lever defining a pivot portion, a manipulating portion, a third lip engagement lug means, and means defining a shoulder; means pivotally connecting said pivot portion to said

mounting plate rearwardly of said perpendicular diameter; and a valve having a threaded mounting means removably mounted to said threaded annular portion of the mounting plate and including a portion extending into the path of pivotal movement of said lever, said lever being arranged to urge said pivot forwardly to force said first and second lug means clampingly against the container lip as an incident of said lever being swung to a clamping position wherein said third lug

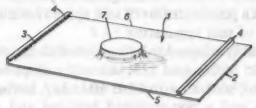


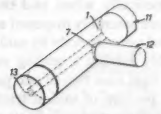
means is forced against said lip adjacent the forward end of said centerline, said lever shoulder abutting said mounting plate stop to positively prevent pivotal movement beyond said clamping position, said lever extending between said mounting plate stop and said valve portion to positively prevent pivotal movement of the lever forwardly from said clamping position when said lever is swung to said clamping position and said valve is threadedly mounted to said mounting plate.

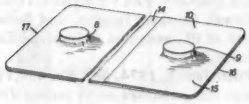
3,982,564
HEAT RECOVERABLE ARTICLE

Robin James T. Clabburn, Highworth, England; Maurice Raymond Pettit, Pellenberg, and Guido De Keermaecker, Leuven, both of Belgium, assignors to Raychem Corporation, Menlo Park, Calif.

Filed Dec. 10, 1973, Ser. No. 423,191
Int. Cl.² F16L *55/16, 57/00*
U.S. Cl. 138—110 **7 Claims**







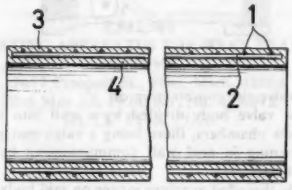
1. A heat-recoverable article adapted to cover a conduit junction having at least three arms comprising, a sheet member, said sheet member having opposite edge regions capable of being brought and held together to form a radially heat shrinkable tubular member, said sheet member having a heat shrinkable wall portion therein, said wall portion defining an aperture said wall portion being an upstanding peripheral wall extending outwardly from a surface of the sheet member and surrounding said aperture, said upstanding peripheral wall having a height and periphery, which height and periphery, upon heating, reduce to form a further upstanding peripheral wall.

3. A heat recoverable article adapted to cover a conduit junction having at least three arms comprising, a heat shrinkable sheet member having a first surface and a second surface, said first and second surfaces each having opposite first and second end regions, said first surface including at least two heat shrinkable wall portions therein, each of said wall portions defining an aperture each said wall portion being an upstanding wall extending outwardly from said first surface of the sheet member and surrounding said aperture, each said peripheral upstanding wall having a height and periphery, which height and periphery, upon heating, reduce to form a further upstanding peripheral wall, said first end region of said second surface capable of being brought and attached to said second end region of said first surface thereby forming a tubular radially heat shrinkable member.

3,982,565
PRESTRESSED CONCRETE PIPE

Hideo Iida, Sagamihara, Japan, assignor to Nippon Hume Pipe Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 393,188, Aug. 30, 1973, abandoned, which is a continuation of Ser. No. 174,787, Aug. 24, 1971, abandoned. This application Apr. 24, 1974, Ser. No. 463,764
Int. Cl.² F16L *9/08*
U.S. Cl. 138—176 **2 Claims**



1. Prestressed concrete pipe comprising a reinforcing cage, said reinforcing cage consisting of longitudinally extending reinforcing members spaced laterally apart and arranged in a circle, and circumferentially extending reinforcement wrapped about the exterior of said longitudinally extending reinforcing members, said longitudinally extending reinforcing members being in an effective reinforcement ratio in the range of 0.16 to 0.25%, said circumferentially wrapped reinforcement being in an effective reinforcement ratio in the range of 1.0 to 1.6%, said effective reinforcement ratios being based on the cross-sectional area of the respective reinforcement component divided by the cross-sectional area of the concrete inwardly of the center axis of the circumferentially wrapped reinforcement, and the effective reinforcement ratios based on the effective reinforcement ratio of the longitudinally extending reinforcing ratio divided by the effective reinforcement ratio of the circumferentially extending reinforcement ratio being in the range of 0.1 to 0.25%, and expansive concrete embedding said reinforcing cage and forming the wall of the pipe.

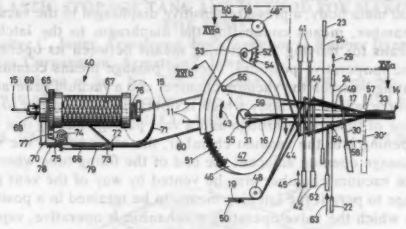
3,982,566
METHOD AND APPARATUS OF MAKING A WOVEN ZIPPER

Friedrich Glindmeyer, Stolberg; Wilhelm Friedrich Hennenberg, Alsdorf, and Karl Limpens, Stolberg, all of Germany, assignors to William Prym-Werke KG, Stolberg, Germany

Division of Ser. No. 484,031, June 28, 1974. This application Jan. 8, 1975, Ser. No. 539,613
Claims priority, application Germany, June 29, 1973, 2333152
Int. Cl.² D03D *1/00*
U.S. Cl. 139—35 **6 Claims**

1. Apparatus for making a woven zipper, comprising first means for forming a warp shed; second means for inserting a weft thread into said warp shed so as to weave a zipper tape; third means for laying onto a longitudinal margin of said zipper tape a plurality of coils formed from a continuous filament; fourth means for weaving said coils to said tape by

means of cover threads which are interwoven with said coils and said tape; a rotor having a side facing towards said third means; harneses which are longitudinally shiftable between end positions and are located at said side and have end portions provided with openings through which respective ones of said cover threads extend, means for shifting said harnesses so that said openings travel in a triangular area determined by the points of intersection of a plane of movement of said second



means with said openings when said harnesses are in the respective end positions, and the point where said filament first contacts said margin when laid upon the same by said third means; and said third means comprising a bifurcated member having two branches which between themselves include said triangular area, said branches having free end portions which converge towards said point where said filament first contacts said margin and forming there with one another a gap.

3,982,567

SHUTTLE RETURN APPARATUS

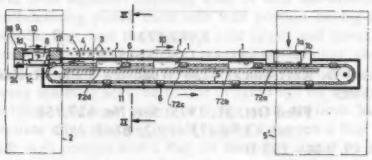
Erwin Pfarrwaller, Winterthur, and Kurt Nick, Ettenhausen, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Continuation of Ser. No. 395,564, Sept. 10, 1973, abandoned. This application Mar. 14, 1975, Ser. No. 558,290

Claims priority, application Switzerland, Sept. 8, 1972, 13196/72

Int. Cl.[2] D03D *47/24*

U.S. Cl. 139—439 **6 Claims**



1. A gripper shuttle loom comprising a plurality of gripper shuttles presenting in cross section a plurality of obliquely inclined faces, shuttle picking means, shuttle catching means, shed-forming means, and means to return said shuttles from the catching to the picking side of the loom outside the shed, said return means comprising:

a. a rail extending across the loom between said picking and catching means, said rail having a groove in the upper surface thereof which is open upwardly and which is bounded at least in part by mutually inclined faces inclined to each other at substantially the same inclination as and engageable against the said faces of the shuttles;

b. an endless loop;

c. two wheels supported on opposite sides of the loom to carry said loop with one run thereof parallel to and adjacent said rail; and

d. a plurality of carrier elements affixed to said loop, each of said elements having a portion extending laterally from the loop whereby upon passage of each such element along said run of the loop said element extends above said rail to a position above said groove to propel one of said shuttles therealong.

3,982,568

DEVICE FOR GRIPPING AND FORMING A SUPPLY OF WEFT THREAD BEFORE WEFT INSERTION

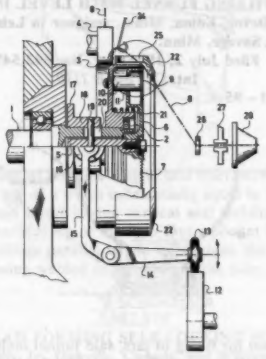
Miloslav Riha; Josef Martinec, and Jiri Cernocky, all of Vsetin, Czechoslovakia, assignors to Zbrojovka Vsetin, narodni podnik, Vsetin, Czechoslovakia

Filed Apr. 9, 1975, Ser. No. 566,412

Claims priority, application Czechoslovakia, Apr. 12, 1974, 2638-74

Int. Cl.[2] D03D *47/36*

U.S. Cl. 139—452 **4 Claims**



1. In a device for gripping and forming a supply of measured weft threads before weft insertion having a rotary measuring drum with a nip disc, the measuring drum having a forwardly open space therewithin and being mounted on a driving shaft, the improvement which comprises an axially displaceable gripping disc mounted on the driving shaft, the gripping disc being provided with a circumferential rim provided with axially projecting teeth spaced thereabout at its forward end, an annular housing coaxial of and surrounding the forward end of the measuring drum and the gripping disc therewithin, the housing and measuring drum presenting an annular groove therebetween through which the measured weft passes to the weft inserting means, the position and axial depth of the annular groove corresponding substantially to the axial length of the teeth on the rim of the gripping disc, and means for cyclically displacing the gripping disc from an axially advanced forward position in which a weft thread is gripped by the teeth on the gripping disc to an axially retracted position in which the weft thread is released from the teeth on the gripping disc.

3,982,569

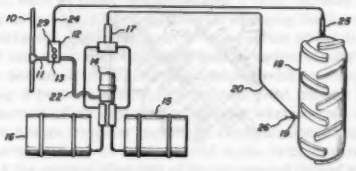
TIRE FILLING APPARATUS AND METHOD

Paul W. Gleason, Minneapolis, and Kenneth E. Lehrke, Osseo, both of Minn., assignors to Graco Inc., Minneapolis, Minn.

Filed June 26, 1975, Ser. No. 590,596

Int. Cl.[2] B65B *3/04*

U.S. Cl. 141—5 **13 Claims**



8. A method of filling a tire with a fluid by introducing the fluid under pressure through the tire air valve stem, comprising the steps of:

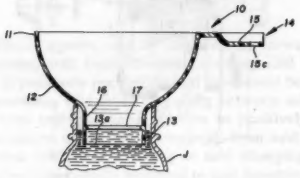
a. positioning the tire substantially vertically with the air valve stem near the bottom;
b. inserting a hollow needle into the tire diametrically opposite the air valve stem;
c. pumping fluid into the tire;
d. relieving the air entrapped in the tire and monitoring the flow thereof through the hollow needle; and
e. stopping the further pumping of fluid into the tire due to the flow of entrapped air ceasing.

3,982,570

JAR FILLING FUNNEL WITH LEVEL INDICIA

Donald R. Devoe, Edina, Minn., assignor to Leisure Technology, Inc., Savage, Minn.

Filed July 2, 1975, Ser. No. 592,549
Int. Cl.² B65B *1/30*
U.S. Cl. 141—95 **2 Claims**



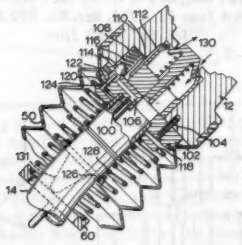
1. A funnel for filling of jars, said funnel including:
a. a generally tapered body portion having an enlarged receiving end and a delivery end of smaller dimension than the dimension of said receiving end;
b. said body providing a stop on the exterior of said enlarged receiving end to abut with the mouth of the jar;
c. said delivery end extending longitudinally from said receiving end, beyond said stop and the end thereof providing the sole means for introducing matter into the jar;
d. marking indicia being provided interiorally of said delivery end, being positioned between the end thereof and said stop and including at least one inwardly directed element visable from said receiving end whereby the filled level of the jar may be visually determined.

3,982,571

VAPOR RECOVERY NOZZLE WITH MECHANICAL FLOW INTERLOCK

David T. Fenton, Madison, Ohio, and Leonard W. Swain, London, Canada, assignors to Emco Wheaton Inc., Conneaut, Ohio

Filed May 16, 1975, Ser. No. 578,044
Int. Cl.² B65B *39/04*
U.S. Cl. 141—225 **1 Claim**



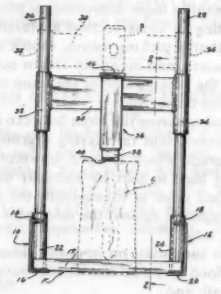
1. In a dispenser nozzle having, a main body portion, a filling tube projecting from one end of said main body portion, and a liquid flow passage extending through said main body and said filling tube, the filling tube being adapted to be located within the open end of a neck of a fuel storage tank of a vehicle or the like, a control valve mechanism for controlling the flow of liquid through said liquid flow passage, said mechanism including a valve operating mechanism and latching means for releasably engaging said valve operating mechanism to render said valve operating mechanism operative when engaged by said latching mechanism and inoperative when released by said latching mechanism, a vacuum chamber in said main body, a pressure sensitive diaphragm in the vacuum chamber, means connecting the diaphragm to the latching means for moving the latching means between its operative and inoperative positions, vacuum passage means communicating between the vacuum chamber and a vacuum generating source within the body which is operative in response to the flow of fluid therethrough and a vent passage having one end opening into the vacuum chamber, the other end of the vent passage opening adjacent the end of the filling tube whereby the vacuum chamber may be vented by way of the vent passage to permit the latching means to be retained in a position in which the valve operating mechanism is operative, vapour recovery passage means formed in said main body, an extensible vapour recovery shroud mounted on said main body and having one end communicating with the vapour recovery passage means of said main body and the other end urged towards the discharge end of the filling tube, the shroud extending substantially coaxially with respect to the filling tube and having a tight seal collar at said other end thereof for engagement with the end of the filling pipe of the gas tank in use to direct vapour expelled from the tank during filling to the vapour recovery passage by way of the shroud, the improvement of;
i. a normally closed check valve mounted in the main body and having a valve member in said vent passage for opening and closing said vent passage to release said latching means when the vent passage is closed thereby,
ii. resilient valve operating is disposed between said shroud and said filling tube and extending from said valve member to said tight seal collar for moving said valve member to said open position when said tight seal collar is moved a predetermined distance towards said body to form a seal with the end of the filling pipe of the gas tank or the like.

3,982,572

MANUAL LOG SPLITTER

Russell D. Kortendick, 4230 Woodview Lane, Racine, Wis. 53405

Filed Oct. 31, 1975, Ser. No. 627,758
Int. Cl.³ A47J *49/02*; B66F *1/00*
U.S. Cl. 144—193 D **2 Claims**



1. A means of splitting a log, said log positioned in a substantially upright position, said means comprising a frame surrounding said log, a substantially-upright guide means

supported by said frame, a wedge-support beam freely slidable vertically on said guide means, a vertically-directed wedge integral with said support beam, said wedge terminating upwardly in an anvil portion, said wedge to be positioned in contact with said log, said log being split by striking said anvil portion with a sledge.

3,982,573

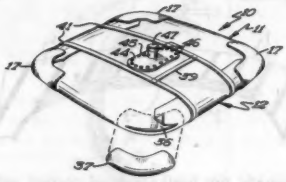
ELASTIC STORAGE TANK AND METHOD FOR MAKING THE SAME

Walter C. Jones, Armstrong, Iowa, assignor to Rubber Dynamics Corporation, Armstrong, Iowa

Division of Ser. No. 478,738, June 12, 1974, Pat. No. 3,919,030. This application July 10, 1975, Ser. No. 594,692

Int. Cl.² A45C *11/00*

U.S. Cl. 150—.5 **1 Claim**



1. An elastic storage tank for fluid or fluid-like material comprising;

a pair of substantially identical end tank sections, each being formed from a single blank of a fiber-reinforced elastomer, each end tank section including upper and lower wall portions, each being defined by a pair of panels formed by folding the blank along a longitudinal fold line, each end tank section including side wall portions extending between and being joined with said upper and lower wall portions, said side wall portions being defined by elongate end panels which are formed by folding one of the upper or lower wall-defining panels along transverse fold lines adjacent opposite ends of said last-mentioned wall-defining panel, each side wall portion having a triangular flap, and the other of said upper and lower wall portions having a pair of generally triangular shaped flaps, each projecting therefrom and overlapping and being sealingly secured to one of said flaps on a side wall portion, said one upper or lower wall portions having arcuate edge portions, each located between a flap on a side wall portion and a flap on the other upper or lower wall portion, a pair of formed arcuate attachment members, each being sealingly secured to the lapped flaps on a side wall portion and on the other of said upper or lower wall portions, and to an arcuate edge portion of said one of the upper or lower wall portions, and means sealingly securing the end tank sections together.

3,982,574

FLEXIBLE PORTABLE DISPENSING CONTAINER

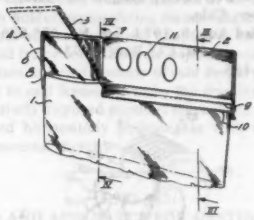
Rodolfo Edmundo Bianchi, and Olga Beatriz Ueltschi De Bianchi, both of 233 Sobremonte Street, San Rafael (Mendoza), Argentina

Filed May 7, 1975, Ser. No. 575,235

Int. Cl.² B65D *31/14*

U.S. Cl. 150—9 **1 Claim**

1. Flexible portable dispensing container having a resealable closure, said container comprising an L-shaped bag made from tubular extruded thermoplastic material having transverse heat seal weldings defining the bottom of the bag and the upper portion of the horizontal leg of the L while the sides of the bag are defined by the folds defining the sides of the tubular material and a vertical heat seal welding on the inner side of the vertical leg at the L to form a tube defined by the vertical leg of the L and an insert, said insert comprising a folded foil of a thermoplastic film to form two plies being heat sealed at lower edges to the back of said bag below the upper portion of the horizontal leg of the L to provide an extension



in the direction of the tube length, said insert having a cut out of the front ply of a width substantially equal to the width of said tube, said insert having vertical seal weldings on either side of the vertical leg of the L so that a pocket is formed by said two weldings parallel to the tube edges, the back ply of said insert being welded to the back of the tube.

3,982,575

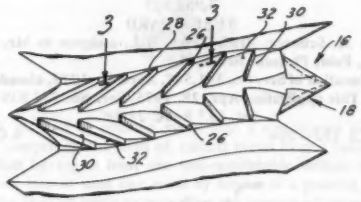
THREAD FORMING SELF-LOCKING SCREW

Raymond Ollis, Jr., Oakville, Canada, and William J. Thomas, Glenside, Pa., assignors to Standard Pressed Steel Co., Jenkintown, Pa.

Filed Dec. 23, 1974, Ser. No. 535,393

Int. Cl.² F16B *39/30*

U.S. Cl. 151—22 **19 Claims**



1. A thread forming fastener for forming generally complementary threads in a workpiece comprising a shank having at least a portion of its length provided with an external thread defined by a pair of thread flanks, at least a portion of said external thread having an irregular surface configuration formed on both of its flanks, said irregular surface configuration comprising a plurality of serrations in the form of teeth when viewed along a cylinder concentric with the longitudinal axis of said fastener, said teeth extending inwardly from adjacent the crest of said thread portion, between the flanks thereof, to a termination inwardly of the pitch diameter thereof, each of said teeth comprising a ramp inclined downwardly in the direction of rotation for engaging the fastener in the workpiece extending from a root portion at the forward end of said ramp with respect to said direction of rotation to a crest portion at the rearward end thereof with an abrupt wall defining a buttress extending from said crest portion to the root portion of an adjacent tooth, and wherein said thread portion has an irregular peripheral configuration comprising extension portions of each of said teeth extending radially beyond the original diameter of the unserrated thread portion crest, each of said extension portions having a maximum diameter adjacent said root portion of their associated teeth; whereby an interrupted contact is provided between said crest

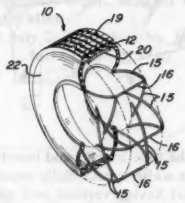
portion of each of said teeth and the workpiece as the fastener is turned into the workpiece to produce a complementary thread therein with a minimum of drag torque.

3,982,576

TIRE STRUCTURE AND METHOD

Henry Replin, Denver, Colo., assignor to Vector Wheel Corporation, Denver, Colo.

Filed Aug. 9, 1974, Ser. No. 495,936
Int. Cl.² B60C 9/02
U.S. Cl. 152—155 7 Claims



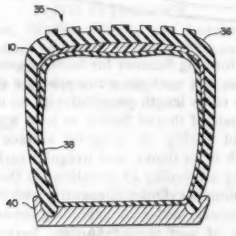
1. A pneumatic tire structure, comprising: a tread, sidewalls extending from the tread and defining an inner annular opening, an inner annular member, an outer annular member positioned radially outwardly of and symmetrically with the inner annular member, and a plurality of elongated connecting members extending through and within the sidewalls but movable independently thereof to connect the inner annular member to the outer annular member for transfer of forces through tension of the elongated connecting members and, accordingly, between the inner annular member and the outer annular member.

3,982,577

TUBE GUARD

Frank M. Scimeca, Brick Town, N.J., assignor to Mr. Tuffy Co., Point Pleasant Beach, N.J.

Continuation of Ser. No. 351,547, April 16, 1973, abandoned.
This application Apr. 28, 1975, Ser. No. 571,939
Int. Cl.² B60C 21/04
U.S. Cl. 152—204 6 Claims



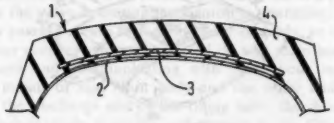
1. A tube guard for protecting air filled inner tubes of relatively narrow tires of a bicycle, said tube guard being located when in use between the inner tube and an outer rubber tire casing and comprising a singular annular guard member made entirely from a non-compressible, flexible solid plastic material having a high resistance to penetration, said guard member having a generally U-shaped arcuate cross-section and including a central section integral with two spaced apart, generally parallel peripheral sections which extend radially inward from said central section, the cross-sectional thickness of said central section being greatest at the midportion thereof and being least at the end portions thereof, the cross-sectional thickness of said guard member being less than the cross-sectional thickness of the tire casing, and wherein the cross-sectional thickness of said peripheral sections gradually tapers from the junction with said central section to the end thereof such that said peripheral sections have the smallest cross-section at the end portions thereof, said guard member further including an outer surface which, when in use, abuts the inner wall of the tire casing and a smooth inner surface which, when in use, abuts the outer surface of the inner tube.

3,982,578

PNEUMATIC TIRES

Hiram Leslie Wild, Sutton Coldfield, England, assignor to Dunlop Limited, London, England

Filed June 18, 1974, Ser. No. 480,387
Claims priority, application United Kingdom, June 26, 1973, 30256/73
Int. Cl.² B60C 9/18
U.S. Cl. 152—358 26 Claims



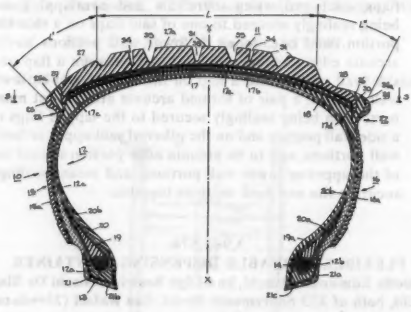
1. A pneumatic tire having a tread portion and sidewall portions and comprising a reinforcing layer in at least one of the tread portion and the sidewall portions, said reinforcing layer including at least one metal wire felt, the felt comprising a mat of interpenetrated substantially aligned crimped continuous untensioned metal wires intermingled in three dimensions.

3,982,579

PNEUMATIC TIRE

Henri J. Mirtain, Compiegne, France, assignor to Uniroyal S.A., France

Filed July 18, 1974, Ser. No. 489,686
Claims priority, application France, July 27, 1973, 73.27733
Int. Cl.² B60C 9/18, 11/04
U.S. Cl. 152—361 R 19 Claims



1. A pneumatic tire comprising a cord reinforced carcass; a tread overlying the crown region of said carcass; a reinforcing breaker disposed beneath said tread in the crown region of said carcass; and first and second axially directed annular protuberances formed at corresponding first and second shoulders of said tire, one of said protuberances having a radially outer surface which is radially recessed from the profile of the tread, the radius of the cross-sectional arc of curvature of said reinforcing breaker being greater than the radius of the cross-sectional arc of curvature, collectively, of

said tread and said first and second protuberances when the tire is in the inflated unloaded condition, and the lateral side edges of said reinforcing breaker extending into and terminating adjacent the outer edges of said protuberances.

3,982,580

PNEUMATIC TIRE FOR CONSTRUCTION VEHICLES

Osamu Inoue; Masaru Abe, both of Sayama, and Toshiro Tezuka, Higashi-Murayama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Oct. 18, 1974, Ser. No. 515,953

Claims priority, application Japan, Oct. 23, 1973, 48-118466; Oct. 23, 1973, 48-122310[U]

Int. Cl.² B60C *9/18, 9/04*

U.S. Cl. 152—361 R **10 Claims**

1. A pneumatic tire for construction vehicles comprising:
a plurality of carcass ply layers having a bias construction of textile cords, said textile cords being turned around a bead bundle located at one of a pair of beads,
a breaker having at least one rubberized steel cord layer superimposed over said plurality of carcass ply layers and extending symmetrically with respect to the peripheral center line of the tire, and
a tread rubber layer superimposed over said breaker,
said breaker rubberized steel cords having a gap ratio δ defined by the equation:

$$\delta = \frac{D-d}{D} = 0.67 \text{ to } 0.83$$

where D is a distance between centers of two adjacent cords and *d* is a diameter of the cord.

3,982,581

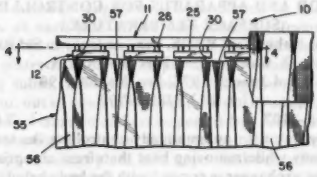
DRAPERY HANGER AND MANIPULATOR

Harold L. Madsen, 14615 S. Clark St., Dolton, Ill. 60419

Filed Dec. 18, 1974, Ser. No. 533,872

Int. Cl.² A47H *5/00, 13/14*

U.S. Cl. 160—340 **6 Claims**



1. A drapery hanger and manipulator for supportably hanging and manipulating one or more drapery curtain panels comprising a frame adapted to be positioned above an area to be covered by a drapery panel, a drapery curtain holder means movably mounted on said frame and adapted to hold a drapery curtain panel in a vertically suspended fashion at an angle and in a horizontally adjacent position with respect to said area to be covered by the drapery curtain, said holder means having a drapery curtain holder extending from said frame and having drapery curtain retaining means on two adjacent angularly disposed sides thereof to hold corresponding adjacent portions of the drapery curtain panels at an angle therebetween, and a holder manipulating means interconnecting said frame and said holder means and adapted to move said holder means on said frame for selectively adjusting said angle of said drapery curtain and said position of said drapery curtain panel with respect to said frame, whereby the drapery curtain panel and the angularly disposed portions thereof are independently angularly and horizontally positionable with respect to the area to be covered thereby.

3,982,582

METHOD AND APPARATUS FOR CASTING METALS INTO A CONTINUOUS CASTING MOLD

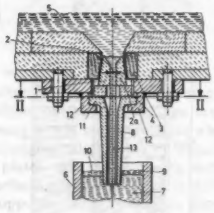
Eberhard Knorr, Amberg; Thomas Ludwig Grünwald, Sulzbach-Rosenberg, and Arno Oswald, Prinzing, Cham, all of Germany, assignors to Concast AG, Zurich, Switzerland

Filed Dec. 2, 1974, Ser. No. 528,721

Claims priority, application Germany, Dec. 8, 1973, 2361344

Int. Cl.² B22D *11/10*

U.S. Cl. 164—136 **14 Claims**



1. A method of pouring metal into a continuous casting mold, comprising the steps of: casting metal from a ladle into a tundish having at least one non-regulatable bottom outlet and then into at least one mold by means of a pouring tube, after the start of casting controlling the casting jet emanating from the bottom outlet, and when necessary correcting the formation of the casting jet to a desired casting jet formation, and thereafter bringing the pouring tube through the casting jet into the casting position.

3,982,583

OPTIMIZED AIR CONDITIONING SYSTEM

Gideon Shavit, Highland Park, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

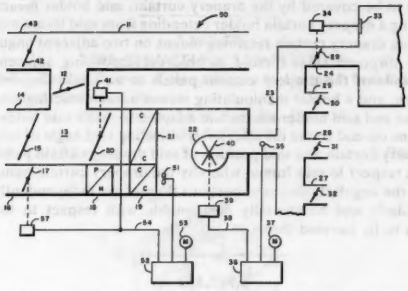
Filed Dec. 30, 1974, Ser. No. 537,287

Int. Cl.² F24F *11/02*

U.S. Cl. 165—16 **22 Claims**

1. An air flow control apparatus for use in an air conditioning system having a source of minimum outdoor air, a source of variable outdoor air, a source of return air, and discharge means for discharging a combination of said outdoor air, variable outdoor air and/or return air to at least one zone, said control apparatus comprising:
damper means for regulating the minimum amount of outdoor air admitted to said system;
air property sensing means for providing an output signal dependent upon the air property in said system; and,
control means responsive to said output signal and connected to said damper means for operating said damper

means for insuring that said minimum outdoor air is maintained at a substantially predetermined level regardless of the amount of air discharged by said discharge means.

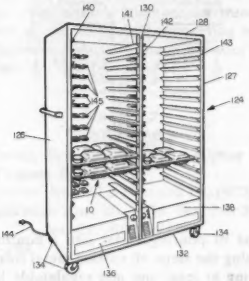


3,982,584

GAS TEMPERATURE AND FLOW CONTROL SYSTEM

Louis Spanoudis, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 23, 1975, Ser. No. 571,037
Int. Cl.² F25B 29/00
U.S. Cl. 165—42 11 Claims



1. A temperature control system for the contents of the compartments of a two-compartment tray which comprises, in combination:

means for supporting said trays in a uniform vertical array;

an enclosure for said array of trays;

refrigeration means for cooling a flow of gas passing therethrough to present a flow of refrigerated gas;

heating means for heating a flow of gas passing therethrough to present a flow of heated gas;

a flow distributor, mounted in said enclosure, having a first inlet manifold and a first outlet manifold connected to said refrigeration means and a second inlet manifold and a second outlet manifold;

a plurality of nozzles, in communication with said first and second inlet manifolds and said first and second outlet manifolds, for engagement with the compartments of said trays, said nozzles being positioned to allow one nozzle in communication with said first inlet manifold, and one nozzle in communication with said first outlet manifold to engage one compartment of each of said trays and one nozzle in communication with said second inlet manifold and one nozzle in communication with said second outlet manifold to engage the second compartment of each of said trays; and

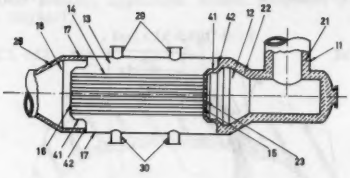
flow control means, connected to said flow distributor, for selectively connecting either said refrigeration means or said heating means to said second inlet and outlet manifolds.

3,982,585

HEAT EXCHANGE APPARATUS

Jorgen Gribsvad, Espergaerde, Denmark, assignor to Haldor Topsoe A/S, Soborg, Denmark

Filed Dec. 2, 1974, Ser. No. 528,972
Claims priority, application United Kingdom, Nov. 19, 1974, 56843/73
Int. Cl.² F28F 5/00, 9/12
U.S. Cl. 165—83 2 Claims



1. An improved apparatus for indirect exchange of heat between two fluid streams, said apparatus comprising a cylindrical pressure shell enclosing a bundle of straight and parallel exchange tubes through which one of said fluid stream is circulated, an inlet tube sheet to which a first end of each exchange tube is permanently attached, and an outlet tube sheet to which a remaining end of each exchange tube is permanently attached; said inlet and outlet tube sheets defining inlet and outlet chambers at opposed ends of said pressure shell, wherein the improvement comprises a flexible joint for carrying the load of said bundle of tubes and for securing said inlet tube sheet to said pressure shell, said flexible joint comprising a flexible cylindrical skirt element having opposed first and second peripheral edges, said first edge continuously and gradually merging with said inlet tube sheet to form a continuous and integral flexible joint therebetween, said cylindrical skirt element being in spaced relationship with the inner surface of said pressure shell; and

a flexible annular sheet extending between an interior surface of said pressure shell and said second edge of said skirt element furthest from said inlet tube sheet, a radially outermost periphery of said annular sheet continuously attached to said interior surface of said pressure shell, a radially innermost periphery of said annular sheet gradually merging with said skirt element second edge to form another continuous and integral flexible joint;

whereby at least one of said skirt element and said annular sheet joints flex upon thermal expansion of said exchange tubes.

3,982,586

METHOD AND APPARATUS FOR CONTROLLING SURFACE TEMPERATURE

Theodore A. Ruble, Fort Worth, Tex., assignor to Sid Richardson Carbon & Gasoline Co., Fort Worth, Tex.

Filed June 5, 1975, Ser. No. 584,190
Int. Cl.² F28F 27/00
U.S. Cl. 165—107 7 Claims

1. An apparatus for automatically controlling the temperature of a body while removing heat therefrom comprising:

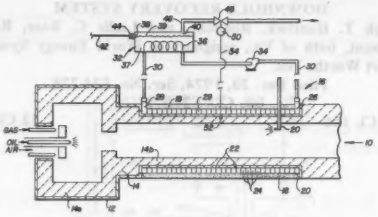
a first heat exchanger in contact with the body being cooled;

a second heat exchanger spaced from said first heat exchanger;

conduit means interconnecting said first and second heat exchangers for circulating therebetween a first heat exchange liquid for removing heat from said body;

a second heat exchange liquid in said second heat exchanger;

said second heat exchange liquid having a lower boiling point than said first heat exchange liquid whereby the heat transferred from said first heat exchange liquid to said second heat exchange liquid will cause said second heat exchange liquid to boil in said second heat exchanger to produce vapor of said second heat exchange liquid;



pressure control means for controlling the pressure of said vapor in said second heat exchanger;

temperature sensing means for sensing the temperature of said body being cooled;

operator means in operative connection with said pressure control means and said temperature sensing means for adjusting said pressure control means to decrease the pressure of said vapor in said second heat exchanger in response to an increase in the temperature of said body being cooled.

3,982,587

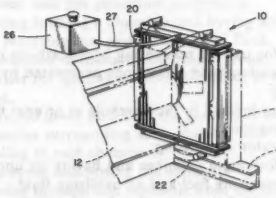
VEHICULAR RADIATOR ASSEMBLY

Vernon N. Tramontini, Indianapolis, Ind., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed Nov. 20, 1974, Ser. No. 525,355

Int. Cl.² F28F *9/00*

U.S. Cl. 165—149 **2 Claims**



1. A radiator assembly, comprising; a core assembly including a plurality of rows of fluid carrying tubes, a plurality of rows of fins separating said fluid carrying tubes and including outer fin rows at each side of the core assembly, said outer fin rows having generally vertical mounting surfaces, side frame channel members engaging and connected to the mounting surfaces at each side of the core assembly frame elements connected to and supporting said frame channel members, header plates fixed to the upper and lower ends of the fluid carrying tubes, said header plates being completely unconnected to, out of contact with, and vertically spaced from said side channel frame members to permit free relative expansion and contraction movement therebetween, an upper tank fixed to said upper header plate, said upper tank being unconnected to the side frame members so that the upper tank is supported by said core assembly, an inlet fitting communicating with said upper tank, a lower tank fixed to said lower header plate, said lower tank being unconnected to said side frame members so that the lower tank is supported by said core assembly, and an outlet fitting communicating with said lower tank.

3,982,588

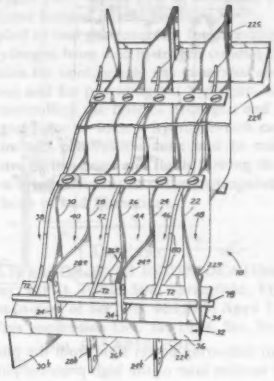
GREASE-COLLECTING HEAT EXCHANGER INSTALLATION

William J. Darm, 5815 SW. Tucker, Beaverton, Oreg. 97005

Division of Ser. No. 252,909, May 12, 1972, Pat. No. 3,827,343, and a continuation-in-part of Ser. No. 468,659, May 10, 1974. This application May 28, 1974, Ser. No. 473,512

Int. Cl.² F28D *9/02*; **F28F** *3/00*; **F28G** *1/16*

U.S. Cl. 165—165 **11 Claims**



1. A heat exchanger apparatus comprising:

a heat exchanger having first passage means and second passage means within said exchanger which are disposed in heat-exchanging relationship on opposite sides of heat exchanger plates, said plates having their ends split into two end portions which are joined to different exchanger plates on opposite sides thereof to form said first and second passage means;

means for transmitting air streams of different temperatures through said first and second passage means to cause a heat exchange between said air streams; and

liquid dispensing means for dispensing liquid into one of said first and second passage means.

3,982,589

CLEANING AND PUMPING APPARATUS FOR OIL WELL PRODUCTION

Phillip M. Wilson, Downey; John W. Erickson, Huntington Beach; Charles C. Nelson, Long Beach, and Vitolis Budrys, La Mirada, all of Calif., assignors to Kobe, Inc., Huntington Park, Calif.

Filed May 16, 1975, Ser. No. 578,358

Int. Cl.² E21B *43/00*

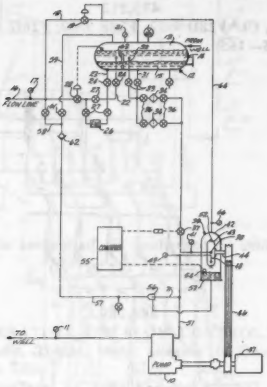
U.S. Cl. 166—53 **15 Claims**

8. In a power fluid pumping and cleaning system for hydraulic pumping of an oil well including a high pressure pump connectable to a well head for delivering high pressure power liquid thereto; and a phase separation vessel for receiving exhausted power liquid and produced well fluid, separating water, oil and gas and delivering fluids to a production flow line; an improved cleaning and pumping system for withdrawing power liquid from the phase separation vessel removing particles from the power liquid and delivering cleaned power liquid under pressure to the suction inlet of the high pressure pump, wherein the improvement comprises:

a combined centrifugal cleaner and pitot pump having a stationary housing, a rotatable cleaning and pumping chamber in the housing, a liquid inlet to the chamber, a stationary pitot tube outlet in the chamber for withdraw-

ing pressurized clean power liquid, and means for discharging dirty liquid from the periphery of the chamber into the housing;

means for connecting the liquid inlet to the phase separation vessel;



means for delivering power fluid from the pitot tube outlet to the suction inlet of the high pressure pump; and

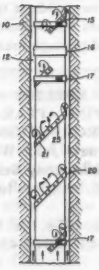
means for pumping dirty liquid from the housing to a production flow line.

3,982,590

WELL BORE CLEANING DEVICE

Donald W. Harriman, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Aug. 4, 1975, Ser. No. 601,819
Int. Cl.² E21B *33/14, 37/00*
U.S. Cl. 166—173 **10 Claims**



1. An apparatus for use in an oil well for creating turbulence in a slurry flowing in an annulus between an oil well casing and the wall of the well bore, comprising:

a strap for being helically wound around and attached to the exterior of said well casing; and,

a plurality of cylindrical means fastened to said strap for extending radially outwardly and sized to extend partially into the annulus without making contact with the wall of the well bore when the casing is centered therein,

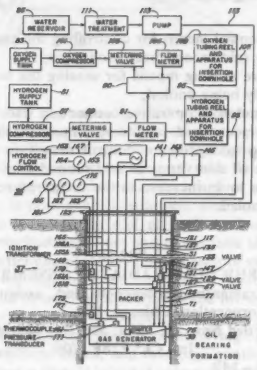
said plurality of cylindrical means being spaced on said strap to provide a random pattern of said cylindrical means on the exterior of said well casing whereby cleaning of the wall of the well bore is effected by vortex trails induced in said slurry by said randomly positioned cylindrical means.

3,982,591

DOWNHOLE RECOVERY SYSTEM

Joseph T. Hamrick, Roanoke, and Leslie C. Rose, Rocky Mount, both of Va., assignors to World Energy Systems, Fort Worth, Tex.

Filed Dec. 20, 1974, Ser. No. 534,778
Int. Cl.² E21B *43/24*
U.S. Cl. 166—302 **52 Claims**



1. A system for use for recovering hydrocarbons or other materials from undergound formations penetrated by a borehole comprising:

a gas generator located in the borehole at or near the level of said formations,

said gas generator comprising:

a housing forming a chamber and having an upper inlet end for receiving fuel and an oxidizing fluid,

said chamber defining a combustion zone,

an igniter for igniting combustible gases in said combustion zone,

a restricted lower outlet for passage of heated gases, and

a cooling fluid annulus surrounding said chamber, said annulus being in fluid communication with said chamber,

means, including conduit means extending from the surface, for supplying fuel from the surface to said inlet end of said gas generator located in said borehole,

means, including conduit means extending from the surface, for supplying an oxidizing fluid from the surface to said inlet end of said gas generator located in said borehole, and

valve means remotely controllable from the surface and located in said borehole near said gas generator for separately controlling the flow of fuel and oxidizing fluid to said gas generator,

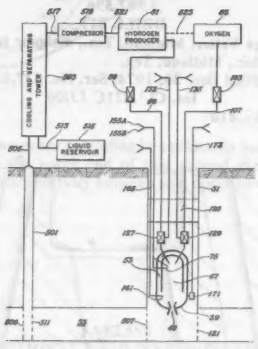
said valve means when located in the borehole near said gas generator being inaccessible without withdrawing said gas generator from the borehole.

3,982,592

IN SITU HYDROGENATION OF HYDROCARBONS IN UNDERGROUND FORMATIONS

Joseph T. Hamrick, Roanoke, and Leslie C. Rose, Rocky Mount, both of Va., assignors to World Energy Systems, Fort Worth, Tex.

Continuation-in-part of Ser. No. 534,778, Dec. 20, 1974, abandoned. This application Sept. 8, 1975, Ser. No. 611,138
Int. Cl.² E21B *43/24*
U.S. Cl. 166—302 6 Claims



1. A process of hydrogenating hydrocarbons in underground formations penetrated by a borehole and wherein a gas generator is located in the borehole at or near the level of said formations, said gas generator comprising:
- a housing forming a chamber and having an upper inlet end for receiving fuel and an oxidizing fluid,
- said chamber defining a combustion zone,
- an igniter for igniting combustible gases in said combustion zone,
- a restricted lower outlet for the passage of heated gases, and
- an annulus surrounding said chamber and having passages leading to said chamber,
- said process comprising the steps of:
  - flowing through said borehole from the surface to said gas generator, by way of separate passages, hydrogen and oxygen to form a hydrogen-rich combustible mixture in said combustion zone,
  - igniting and burning the combustible mixture in said combustion zone, and
- controlling the flow of hydrogen and oxygen to said gas generator to maintain the temperature of the gases and fluids flowing through said outlet at a level sufficient to cause hydrogenation of the hydrocarbons in said formations.

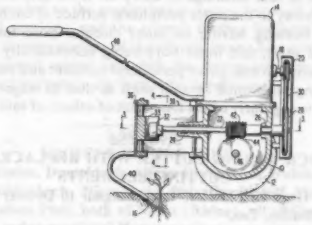
6. A system for use for hydrogenating hydrocarbons in underground formations penetrated by a borehole, comprising:
- a gas generator located in the borehole at or near the level of said formations,
- said gas generator comprising:
  - a housing forming a chamber and having an upper inlet end for receiving fuel and an oxidizing fluid,
  - said chamber defining a combustion zone,
  - an igniter for igniting combustible gases in said combustion zone,
  - a restricted lower outlet for passage of heated gases, and
  - a cooling fluid annulus surrounding said chamber and having passages leading to said chamber,
- a source of hydrogen located at the surface,
- hydrogen conduit means coupled to said source of hydrogen and extending from the surface to said gas generator for supplying hydrogen from the surface to said inlet end of said gas generator located in said borehole,
- a source of oxygen located at the surface,
- oxygen conduit means coupled to said source of oxygen and extending from the surface to said gas generator for supplying oxygen from the surface to said inlet end of said gas generator located in said borehole,
- means coupled to said gas generator for diverting a portion of said hydrogen from said hydrogen conduit means into said annulus for cooling said gas generator and gases of combustion and for providing hot hydrogen, and
- means for controlling the flow of hydrogen and oxygen to said gas generator to form a hydrogen-rich combustible mixture in said combustion zone and to maintain the temperature of the gases and fluids flowing through said outlet at a level sufficient to cause hydrogenation of the hydrocarbons in said formations.

3,982,593

POWER CULTIVATOR WITH RECIPROCATING BLADE

Paul A. Grobey, R.F.D. 1, Box 586, Springfield, Vt. 05156

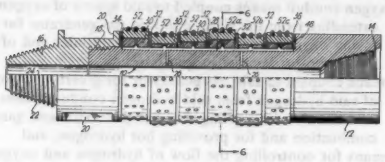
Continuation-in-part of Ser. No. 461,085, April 15, 1974, abandoned. This application Oct. 16, 1974, Ser. No. 515,379
Int. Cl.² A01B *39/10*
U.S. Cl. 172—40 28 Claims



8. A power cultivator comprising:
- a. a body;
- b. a wheel supporting said body during normal use;
- c. a motor mounted on said body;
- d. a blade the contour and all the edges of which are well rounded;
- e. a shaft driven rotationally by said motor during normal use;
- f. an eccentric roll mounted on said shaft;
- g. a follower in contact with and responsive to said eccentric roll;
- h. means for connecting said follower to said blade such that, when the cultivator is being moved over a ground surface during normal use, the working surface of said blade is located beneath the surface of the ground in a plane generally parallel to the surface of the ground and generally perpendicular to the motion of the cultivator; and
- i. a parallelogram linkage connecting said body to said follower,

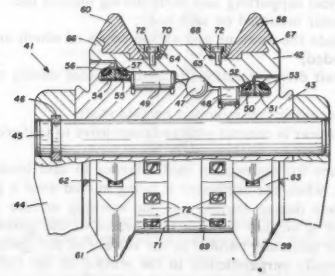
whereby, when said motor is functioning and the cultivator is being moved over a ground surface during normal use, the working surface of said blade will reciprocate in a direction generally perpendicular to the motion of the cultivator and in a plane generally parallel to the surface of the ground, thereby loosening the soil and pulling out weeds without cutting off their roots.

3,982,594
ECCENTRIC STABILIZER
Derek B. Berthiaume, Calgary, Canada, assignor to Bralorne Resources Limited, Calgary, Canada
Filed Sept. 10, 1975, Ser. No. 612,162
Claims priority, application Canada, June 15, 1975, 231,514
Int. Cl.² E21B 17/10
U.S. Cl. 75—337 2 Claims



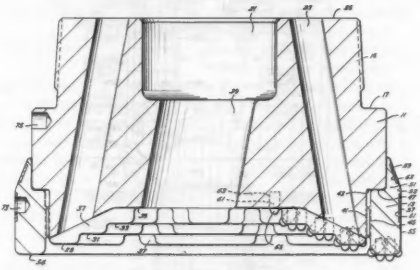
1. A roller stabilizer comprising:
a cylindrical shaft;
means at each end of said shaft for connecting the stabilizer to a drill string;
an axial air passageway in said shaft;
a plurality of axially spaced bushings mounted in axially spaced relation on said shaft;
a plurality of thrust washers, each washer separating a bushing from the adjacent bushing;
a plurality of annular roller reamers, each being mounted for rotation on an outer peripheral surface of an associated bushing and having an axial length corresponding to the distance between the adjacent thrust washers; and
a plurality of interconnected bores and grooves in said shaft and in said bushings to carry air from said axial air passageway to the outer peripheral surface of each bushing;
each bushing having an inner circular bore for receiving said shaft, said inner bore being eccentrically positioned relative to said outer peripheral surface, and each bushing being positioned on said shaft so that its major eccentricity is angularly offset from that of others of said bushings.

3,982,595
ROCK BORING CUTTER WITH REPLACEABLE CUTTING ELEMENTS
Eugene Gray Ott, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed July 24, 1972, Ser. No. 274,532
Int. Cl. E21b 9/14; E21c 13/01
U.S. Cl. 175—373 4 Claims



1. A cutter for an earth boring system that has a rotary unit which bores into earth formations to form a hole therein, said rotary unit functioning to form circular kerfs in the formation being bored to fracture rock between a proximate pair of said kerfs in a manner that causes fragments of the formation to be separated from the formation being bored, comprising:
a cutting wheel mounted upon said rotary unit for rotary motion to roll along the kerfs being cut;
replaceable cutting means substantially encircling said cutting wheel for contacting said formations and forming a kerf therein, said cutting means consisting of a plurality of cutting elements, each of which partially encircle said cutting wheel;
means for removably affixing said cutting means to said cutting wheel;
said means for removably affixing said cutting means to said cutting wheel including a plurality of locking elements adapted to contact said cutting means and retainer means for affixing said locking elements to said cutting wheel, said locking elements include tapered surfaces that overlap said cutting elements; and
means projecting from said cutting wheel between cutting elements for preventing relative movement between said cutting wheel and cutting elements.

3,982,596
DRILL BIT
Vincent Hugo Vetter, Midland, Tex., assignor to Smith International, Inc., Midland, Tex.
Filed Dec. 30, 1974, Ser. No. 537,438
Int. Cl.² E21C 13/00
U.S. Cl. 175—410 14 Claims

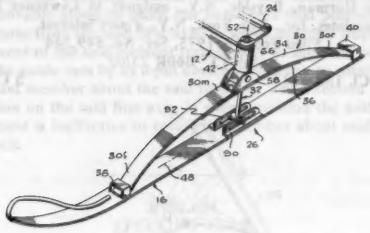


1. A drill bit comprising
a body having boring elements at its lower part and having first releasable connection means for making connection with a drill stem and second releasable connection means for making connection with a gage ring,
a gage ring detachably connected to said body, said ring having boring elements at its lower part and including third releasable connection means for making connection with said bit body via said second connection means,
said boring elements of the gage ring being disposed radially outwardly from said boring elements of the bit body,
the lower part of the bit body whereat the boring elements are disposed being concave and annularly stepped and the lower part of the gage ring whereat the boring elements are disposed providing an outermost annular step axially lower than the other steps, and
flow channels across the steps of the bit body, the gage ring extending transversely across the outer ends of said flow channels.

3,982,597
SNOWMOBILE SKI DAMPENER ARRANGEMENT
Mel Callaway, Riverside, Calif., assignor to Yamaha International Corporation, Buena Park, Calif.
Filed Jan. 10, 1975, Ser. No. 540,094
Int. Cl.² B62M 27/02
U.S. Cl. 180—5 R 9 Claims

1. In a snowmobile having a frame with a front portion, the improvement comprising:
a horizontally-extending ski;
a leaf spring having forward and rearward ends coupled to locations spaced along the length of said ski, and having a middle portion vertically spaced from said ski;
a shock dampener including a cylinder member and a piston member slidable in said cylinder member, a first of said

members coupled to the middle portion of said leaf spring and the second of said members extending downwardly from said first member to a location lying below the level of the middle of said leaf spring and being coupled to said ski;



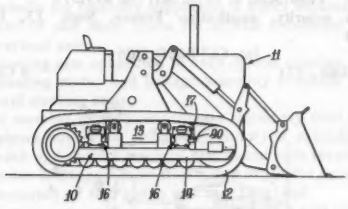
said shock dampener extending in a primarily vertical direction, with the lower end of said second member lying approximately halfway between said opposite ends of said leaf spring.

3,982,598

MULTIDIRECTIONAL RESILIENT SUSPENSION FOR VEHICLES

Robert J. Purcell, Washington; David J. Balzer, East Peoria, and Rollin P. Van Zandt, Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 438,665, Feb. 1, 1974, Pat. No. 3,923,111.
This application Aug. 25, 1975, Ser. No. 607,415
Int. Cl.² B62D *55/00*
U.S. Cl. 180—9.54 **2 Claims**



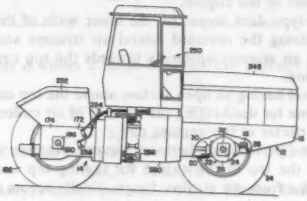
1. A resilient suspension system for a track-type vehicle having a main frame and a track roller frame including; first plate means secured to said main frame and laterally extending therefrom, second plate means secured to said roller frame, a plurality of plates attached to said first plate means and extending toward said second plate means, a plurality of pedestal means attached to said second plate means and extending toward said first plate means, a plurality of resilient pad means mounted on said pedestal means for engaging said plurality of plates and for cushioning both axial and lateral movements between said pedestal means and said plurality of plates and wherein said resilient pad means include at least one resilient pad member bonded to a metallic plate member and wherein said at least one pad member and metallic plate member are secured to said pedestal means at an angle oblique relative to said second plate means.

3,982,599

TRACTOR HAVING TRANSMISSION-DRIVEN POWER TAKE-OFF

Saul Herscovici, Waterloo, and Lawrence Vernon Anderson, Cedar Falls, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Feb. 21, 1975, Ser. No. 551,527
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976
Int. Cl.² B60K *17/28*
U.S. Cl. 180—53 R **8 Claims**



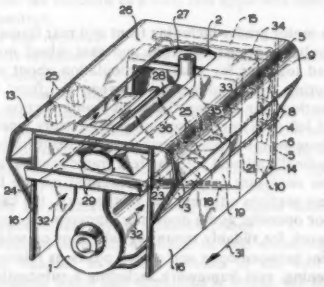
1. A tractor including a wheel supported chassis, an engine supported on the chassis, variable ratio transmission means supported on the chassis and coupling the engine to at least a pair of wheels, operator control means for varying the ratio of the transmission means, a PTO shaft supported on the chassis, and means including clutch means coupling the PTO shaft to the engine, characterized in that the variable ratio transmission means includes a first section having first and second ratio conditions and a second section having a plurality of ratio conditions, the means coupling the PTO shaft to the engine is coupled to the transmission means between the first and second sections, and the tractor further includes means responsive to engagement of the clutch means to override the operator control means and shift the first section to and/or hold the first section in its first ratio condition.

3,982,600

VEHICLE ENGINE HOOD

Jost Gerresheim, Dusseldorf; Alfons Drennhaus, Hulzbuttgen; Hans Breidenbach, Nievenheim-Delrath; Rodolf Mansour, and Christian Pfeil, both of Neuss (Rhine), all of Germany, assignors to International Harvester Company, Chicago, Ill.

Filed July 31, 1975, Ser. No. 600,659
Claims priority, application Germany, Aug. 7, 1974, 2437995
Int. Cl.² B62D *25/10*
U.S. Cl. 180—69 C **10 Claims**



1. In a tractor loader type of vehicle having a chassis, an engine carried on the chassis, an engine cooling system including a fan creating an air flow longitudinally across the engine and blowing it through a heat exchanger carried on the chassis, an exhaust gas muffler connected to the engine, and a hood encasing the engine and cooling system including a grille

mounted to the hood downwind of the heat exchanger, wherein the improvement comprises:

a plate means between the heat exchanger and the grille for sealing the grille;

air guide means on the plate means downwind of the heat exchanger for dividing the air flow from the heat exchanger into a plurality of air streams some flowing upwardly and some flowing laterally and then in a reverse direction to the air flow, the air guide means including an additional air guide means for directing the upwardly directed air streams in a reverse direction towards the top center of the engine;

coffer-type duct means on the inner walls of the hood for receiving the reversed lateral air streams and directing said air streams upwardly towards the top center of the engine;

the hood having an open section above the top center of the engine for discharging the streams of air collected at said top center of the engine;

a second plate means between the open section in the hood and the top of the engine for sealing top center of the engine from the air flow longitudinally across the engine; and

hinge means for tilting the hood away from the engine for gaining access thereto.

3,982,601

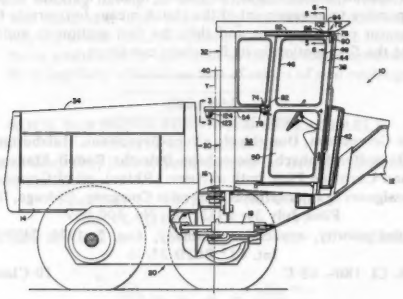
GUIDE SUPPORT FOR SLIDABLE DOOR OF GRADER HAVING AN ARTICULATED FRAME

Lary Lynn Williams, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed May 1, 1975, Ser. No. 573,674

Int. Cl.² B60J *5/06*

U.S. Cl. 180—89 R **8 Claims**



1. In a motor grader including front and rear frame sections respectively supported on front and rear wheel means and connected together for relative articulation about a vertical axis, steering means connected between the front and rear frame sections for moving the front frame section between right and left fully angled positions respectively located equidistant from a central position wherein the front frame section is longitudinally aligned with the rear frame section, a cab and an engine enclosure respectively mounted on the front and rear frame sections adjacent the vertical axis, the cab including a door opening, and a door, the inprovement comprising: a framework for slidably mounting said door on said cab, for movement between open and closed positions relative to said door opening, said framework including a substantially horizontal guide track means including a first guide track located above the door opening and extending rearwardly a slight distance therebeyond and a second guide track located approximately midway between upper and lower bounds of and rearwardly of the door opening; track follower means supporting said door on said first and second tracks for movement between a forward closed position and a rearward open position; and said second guide track including a rearward projection so disposed relative to the engine enclosure and said vertical pivot that when the front frame section is fully angled in the direction of said one side of the cab the projection will extend alongside a forward end portion of the engine enclosure.

3,982,602

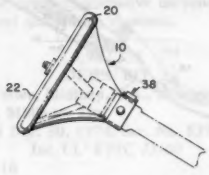
AUTOMOBILE ANTI-THEFT DEVICE

Jonas Gorman, Bayside, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Feb. 12, 1975, Ser. No. 549,344

Int. Cl.² B60R *25/02*

U.S. Cl. 180—114 **3 Claims**



1. A housing device for enclosing the steering wheel of an automotive vehicle to prevent access to said steering wheel, said housing comprising: a truncated generally conical shell defining relatively large and relatively small diameter opposite ends, said large diameter end being configured for encompassing the rim of said steering wheel, said small diameter end terminating in a collar configured for snug fitting engagement about the steering column of said vehicle, said housing being formed in two halves with a parting line disposed in a plane extending through the axis of said shell, hinge means disposed on one side of said shell along said parting line for coupling said halves for relative swinging movement to enable placement of said shell about said steering wheel, and first and second locking means respectively carried by said large diameter end and said collar for selectively securing said halves together to form said shell.

3,982,603

STEERING SYSTEMS FOR GUIDED VEHICLES

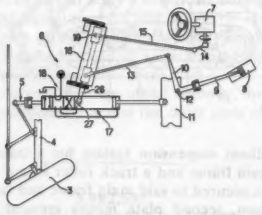
Robert Michael, Paris, France, assignor to Transports-Recherches-Etudes et Groupement d'Interet Economique (TREGIE), Rueil-Malmaison, France

Filed Sept. 8, 1975, Ser. No. 611,579

Claims priority, application France, Sept. 13, 1974, 74.31111

Int. Cl.² B62D *5/06*

U.S. Cl. 180—131 **4 Claims**



1. In a vehicle having a detector for guiding the vehicle along a guidance reference member mounted on a track and further having a steering gear and an actuating linkage for guiding a steering axle in accordance with operation of the steering gear, the improvement comprising a coupling device for coupling the steering gear and the detector to the actuating linkage, the coupling device comprising:

a member mounted for rotation about a first axis and connected to the actuating linkage to move the actuating linkage in accordance with its rotation about the said first axis;

first and second guide bars each connected to the said member and each mounted transversely with respect to

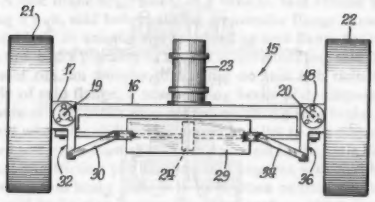
said first axis and with its axis passing through the said first axis;

and first and second elements mounted for movement along the first and second guide bars and mechanically linked to the steering gear and the detector, respectively, the steering gear and detector constituting input devices for the said coupling device, each of the elements being movable along its guide bar between a first position remote from the said first axis, in which position displacement of the said element transversely to the direction of the guide bars by its input device is effective to rotate the said member about the said first axis, and a second position on the said first axis, in which position the said element is ineffective to rotate the member about said first axis.

3,982,604
STEERING AXLE

John T. Crawford, Lyndhurst, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed May 7, 1975, Ser. No. 575,099
Int. Cl.² B62D 5/10
U.S. Cl. 180—158 9 Claims



1. A steering axle assembly for a vehicle, said assembly comprising:

an elongated main frame;

a spindle for rotatably supporting a wheel secured to each end of said main frame for pivotal movement about a vertical axis;

a steering arm connected to each of said spindles;

a steering motor and linkage assembly mounted between said steering arms;

said steering motor comprising a stationary double-acting piston having an elongated piston rod extending from each end thereof, each of said piston rods secured at its outer end to said main frame, and a cylinder reciprocably mounted on said piston and said rods; and

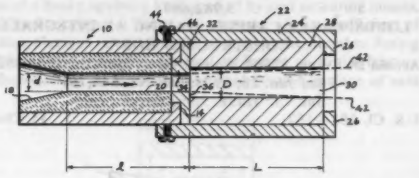
link means pivotally connecting each end of said cylinder to one of said steering arms, and wherein said link means are less than one-fourth the length of said main frame.

3,982,605
NOZZLE NOISE SILENCER

John E. Sneckenberger, Morgantown, W. Va., assignor to The Carborundum Company, Niagara Falls, N.Y.

Filed May 5, 1975, Ser. No. 574,475
Int. Cl.² F01N 1/00
U.S. Cl. 181—47 B 5 Claims

1. A nozzle noise silencer device for reducing noise created by a flow of fluid from a nozzle which includes a nozzle bore having a length *l* and a nozzle exit diameter *d*; said silencer device comprising a body member having a silencer bore extending therethrough and having a silencer bore length L and a silencer bore diameter D, the improvement comprising said silencer bore diameter D being substantially constant throughout its entire length and being larger than said nozzle

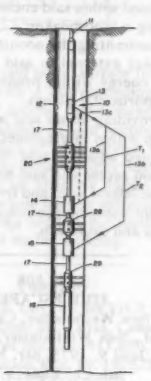


exit diameter *d* within a range between 110 percent and 350 percent.

3,982,606
ACOUSTICAL LOGGING APPARATUS HAVING SIGNAL DELAY MEANS

James E. Berry, Forney, and Andrew J. D. Straus, Dallas, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 22, 1975, Ser. No. 543,000
Int. Cl.² G01V 1/40
U.S. Cl. 181—102 5 Claims



1. An apparatus for carrying out an acoustical logging operation within the borehole of a well, said apparatus comprising:

a transmitter;

at least one receiver;

a support member for spacing said at least one receiver for said transmitter;

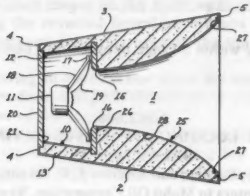
means mounted on said support member between said transmitter and said at least one receiver for interfering with those signals which inherently travel from said transmitter to said at least one receiver in the fluid normally present in the borehole during said logging operation, said signal interference means comprising:

means for rotatably mounting said signal interference means to said support member; and

attenuation elements attached to said mounting means and adapted to extend outward to the wall of said borehole when said apparatus is within the borehole, said attenuation elements positioned on said mounting means so as to present an obstructed path to said signals but so as to present only nominal resistance to displacement of borehole fluid when said apparatus moves within said borehole, said attenuation elements comprising a plurality of fingers attached to said sleeve, said fingers being vertically spaced on said sleeve so

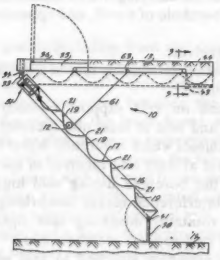
that they radially overlap, thereby providing an obstructed path for said signal in said fluid.

3,982,607
LOUDSPEAKER CABINET HAVING AN INTEGRALLY CONSTRUCTED HORN
Arnold D. Evans, 17500 Wolcott Lane, Marana, Ariz. 85238
Filed Jan. 28, 1975, Ser. No. 544,763
Int. Cl.² H05K 5/00; G10K 11/00
U.S. Cl. 181—152 **11 Claims**



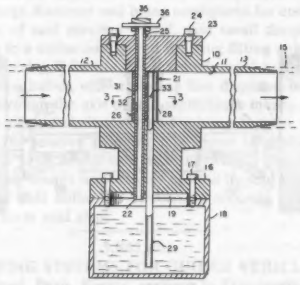
1. A loudspeaker cabinet having lateral sides and front and rear ends and including at least one loudspeaker disposed therein, said cabinet comprising in combination:
   a. a recess disposed within said enclosure for circumscribing and supporting a loudspeaker;
   b. a horn for transmitting the acoustic energy generated by the loudspeaker external to said cabinet and dispersing the acoustic energy within predetermined angles in the vertical and horizontal planes;
   c. means for providing an air seal intermediate said recess and said horn within said cabinet; and
   d. means disposed adjacent said recess and said horn for supporting said recess and said horn in fixed spatial relationship to the lateral sides and front and rear ends of said cabinet and for damping acoustically generated vibration of said recess and said horn.

3,982,608
FIRE ESCAPE
Frederick Booth, New Westminster, Canada, assignor to Booth Fire Escape Ltd., New Westminster, Canada
Filed June 9, 1975, Ser. No. 585,311
Int. Cl.² E06C 9/10
U.S. Cl. 182—49 **4 Claims**



1. A fire escape apparatus for buildings having balconies arranged one above the other comprising:
   a. a frame having a pair of parallel spaced side supports,
   b. means swingably mounting the frame at one end to an upper balcony for swinging movement between a horizontal position against the underside of the upper balcony and an inclined position resting on a lower balcony therebeneath,
   c. a strip of smooth material extending between and secured in the side edges to the side supports, said strip presenting a longitudinally extending series of sweeping upwardly concave portions and intervening crest portions, the curved portions being arranged so that with the frame in the inclined position the strip presents a set of stairs having downwardly and outwardly curved risers and inwardly and downwardly sloping treads,
   d. counter-balance means for yieldably resisting movement of the frame from its horizontal position to its inclined position.

3,982,609
AIR LINE LUBRICATOR
Edward J. Bouplon, Cochranton, Pa., assignor to Chicago Pneumatic Tool Company, New York, N.Y.
Filed July 7, 1975, Ser. No. 593,640
Int. Cl.² F16N 7/34
U.S. Cl. 184—56 A **8 Claims**



1. A lubricator, for feeding oil into a live air stream passing through a supply line to a pneumatic tool, comprising a body having a base mounted atop an oil reservoir and having side inlet and outlet ends connectible in a live air supply line, a linear passage of uniform diameter extending through the body from the inlet to the outlet end, a first tube in the body extending radially through the passage having an open bottom end projecting from the base of the body into an upper area of the reservoir proximate the surface of the oil therein and having a closed top end projecting externally of the body, a port opening out of a side area of the tube into the passage facing in the direction of the inlet end of the passage, a second tube in the body extending radially through the passage in parallel relation to the first tube but to the outlet side of the passage, the second tube having an open upper end disposed in close proximity to the wall of the passage and having an open bottom end projecting from the base of the body beyond the first tube into the oil within the reservoir, ports opening out of side areas of the second tube within the passage in opposed spaced relation to the wall of the passage, and air flow interference means disposed within the passage in surrounding relation to both tubes for causing impingement in part of an inlet air stream in the passage substantially directly into the port of the first tube and for causing the air stream in part to flow over the ports of the second tube toward the outlet end of the passage.

3,982,610

CONICAL SHAPED DISC BRAKE FOR A VEHICLE

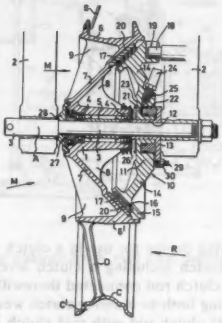
Tullio Campagnolo, Corso Padova, 168, 36100 Vicenza, Italy

Filed Feb. 5, 1975, Ser. No. 547,251

Claims priority, application Italy, Feb. 5, 1974, 20177/74; June 7, 1974, 23719/74

Int. Cl.² B60T 1/06

U.S. Cl. 188—18 A 13 Claims



1. A disc brake for a wheel of a vehicle, said vehicle wheel having a hub, said hub including an annular flange surrounding said hub, an annular rim surrounding said flange for carrying a tire, and a plurality of spokes interconnecting said flange and said rim, an annular brake disc on said hub radially inwardly of said flange, a non-rotating brake plate disposed on one side of said brake disc, means mounting said brake plate on said wheel for sliding movement parallel to the wheel axis toward and away from said brake disc, said brake plate having at least one friction pad thereon that engages with said brake disc when said brake plate is in its position nearest said brake disc, said brake disc having a braking surface which engages an adjacent surface of said at least one friction pad, said surfaces lying on a common cone coaxial with said wheel, the apex of said cone being directed away from said brake plate, fluid pressure means for urging said at least one friction pad and said braking surface of the disc into engagement with each other, said fluid pressure means comprising a cylinder-piston unit, coaxial with the wheel axis, comprising a circular recess on the side of a central flat part of the plate which is opposite the disc, an annular piston housed in said recess, and means for feeding brake fluid under pressure to the bottom of said recess, between said bottom and the piston, as well as a contrast element opposing the thrust of said piston, said piston bearing freely against said contrast element on the side of said piston which is opposite the disc, and spring means urging said braking surface and said at least one friction pad apart.

3,982,611

DISC BRAKE TORQUE REGULATING STRUCTURE

Jack Edward Gannon, Coventry, England, assignor to Girling Limited, Birmingham, England

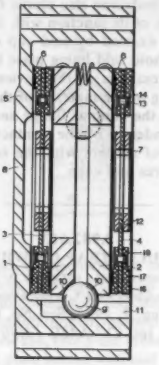
Continuation-in-part of Ser. No. 343,979, March 22, 1973, abandoned. This application Oct. 10, 1974, Ser. No. 513,848

Claims priority, application United Kingdom, Mar. 23, 1972, 13562/72

Int. Cl.² F16D 55/00

U.S. Cl. 188—71.1 14 Claims

1. In a disc brake for a vehicle comprising first and second brake members, one of said members being a disc rotatable relative to the other member, a body of friction material attached to said first brake member, said first and second brake members and said friction material being sufficiently rigid that the operation of the brake does not depend on resilient deformation of said brake members and of said friction material, a friction surface on said second brake member, and actuating means for bringing said friction material into engagement with said friction surface of said second brake member to apply the brake, said friction material being substantially rigid and non-deformable irrespective of the magnitude of a brake applying load applied by said actuating means, said friction material being of a material whose coefficient of friction changes relative to said second brake member during bedding of said friction material including an initial friction surface having an area less than said friction surface of said



second brake member, said initial surface being positioned so as to be engageable with a corresponding portion of said friction surface of said second brake member and be worn away thereby during bedding of said friction material before the whole friction surface of said second brake member is engaged by said friction material after bedding, said initial friction surface having an effective radius larger than the effective radius of said whole friction surface if the coefficient of friction increases during bedding but smaller if the coefficient of friction decreases during bedding.

3,982,612

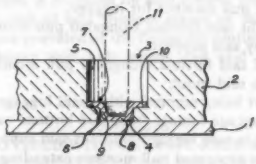
BRAKE LINING DEVICE

Morris Krupka, 45 St. Jude St., Laval, Canada

Continuation-in-part of Ser. No. 511,050, Oct. 1, 1974, abandoned. This application Aug. 19, 1975, Ser. No. 605,952

Int. Cl.² F16D 69/04

U.S. Cl. 188—73.1 1 Claim



1. A brake lining device comprising a rigid metal support, a lining plate of friction material positioned against one face of said rigid metal support, said lining plate having a plurality of circular apertures spaced from one another, each aperture having a larger diameter portion and a smaller portion defining a flat shoulder at their junction, said shoulder facing away from said support and a cap of metal, positioned in each aperture, each cap including a generally tubular body having an integral flat bottom wall closing one end of said tubular body, and a flat annular flange integral with the free edge of said tubular body, and radially outwardly extending therefrom, said flange having a flat top face and a flat underface,

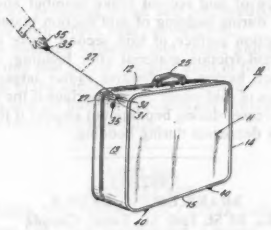
said tubular body being circular in cross-section and flaring from said bottom wall toward said flange, the thicknesses of said flange, of the wall of said tubular body and of said bottom wall, being substantially equal the distance between the outer face of said bottom wall and the underface of said annular flange being slightly less than the axial length of said reduced diameter aperture portion in the non-stressed condition of said cap, said cap bottom wall being spot welded to said metal support in face-to-face contact, said flange engaging said shoulder with a predetermined pressure due to elastic elongation of said tubular body and also elastic flexing of said flange mainly in the region of its junction with the free edge of said body, the pressure exerted by said cap on said lining plate being sufficient to hold said lining plate in firm contact with said support in normal use of the device but insufficient to cause plastic flowing of the material of the lining plate out of the region between the annular flange and the metal support and consequent tendency of the contact face of the lining plate to come out of contact with the support in the zones between the apertures and caps.

3,982,613

RETRACTABLE PULL STRAP ON WHEELED LUGGAGE

Robert H. Wood, Dover, Del., assignor to Leeds Travelwear, a division of Rapid-American Corporation, Clayton, Del.

Filed Aug. 7, 1975, Ser. No. 602,553
Int. Cl.² A45C *13/00*
U.S. Cl. 190—58 B 7 Claims



1. In luggage having top, bottom side and end walls, a flexible elongated pull member for luggage,

a support for said flexible elongated pull member, a spool carried by said support;

one end of said flexible elongated pull member being attached to said spool;

said support being secured within said luggage at a portion of said luggage remote from said bottom wall;

an opening in said luggage adjacent said support;

said flexible elongated pull member extending through said opening to the exterior of said luggage;

said spool being biased to retract and wind up said flexible elongated pull member;

said flexible elongated pull member being extendable through sid luggage opening to pull the luggage and being retractable by said spool when released;

said support comprising a casing; said casing having an opening through which said flexible elongated pull member is drawn; said casing opening and said luggage opening being aligned;

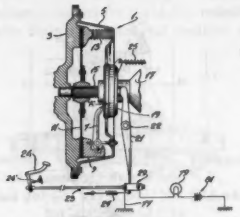
said casing being mounted on the interior of the top wall of the luggage and the said opening in the luggage is at an area thereof adjacent a junction between the said top wall and an end wall.

3,982,614

CLUTCH RELEASE BEARING MONITORING DEVICE

Jean-Pierre Bisaillon, 280 Guillerm, Longueuil, Quebec, Canada

Filed Dec. 11, 1974, Ser. No. 531,711
Int. Cl.² F16D *66/00*
U.S. Cl. 192—30 W 4 Claims



1. A monitoring device for use in a clutch system, the system having a clutch including a clutch lever, and a clutch pedal having a clutch rod connected therewith, said monitoring device serving both to monitor clutch wear and to operably connect said clutch rod with said clutch lever, and comprising:

a. a first member carried by said clutch rod, and including a projecting portion;

b. a second member including an end wall and side wall means, said first member being received within said second member and being movable relative thereto, said end wall having an opening therethrough sized to receive said projecting portion of said first member, and the end of said side wall means of said second member located opposite said end wall having means thereon for operably engaging said clutch lever;

c. resilient means effective to bias said first member away from said end wall and toward the end of said second member disposed opposite said end wall, said first member being urged toward said end wall against the force of said resilient means when said clutch pedal is depressed to operate said clutch rod, and when said clutch lever pulls on said second member against said clutch rod;

d. wear signaling means; and

e. actuating means connected with said wear signaling means, said actuating means being mounted on the outer side of said end wall of said second member, and being operable by said projecting portion of said first member extending through said opening in said end wall when said first member has been moved beyond a predetermined distance toward said end wall against the force of said resilient means.

3,982,615

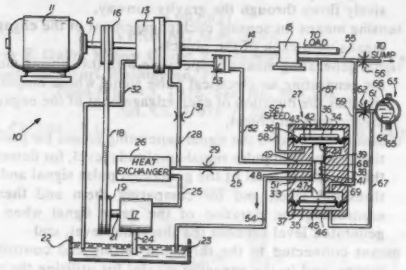
CONSTANT SPEED DRIVE

David F. Reed, Kansas City, Mo., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Feb. 7, 1975, Ser. No. 547,840
Int. Cl.² F16D *25/02*
U.S. Cl. 192—103 F 9 Claims

1. A constant speed drive for a shaft driving a load, comprising a source of energy to drive the shaft, a clutch assembly interposed between the energy source and the shaft, an actuator for the clutch assembly, and a control circuit for the clutch assembly responsive to the speed of rotation of the shaft, said control circuit including means driven by said shaft to provide a fluid pressure proportional to shaft speed, means providing a source of fluid pressure for said actuator, a spool valve actuated by said fluid pressure means to control said actuator pressure and having a valve stem operatively connected to at least one diaphragm at an end thereof, said fluid pressure means driven by the shaft communicating with one side of the

diaphragm and a reference pressure source communicating with the opposite side of the diaphragm, and means for damping any pressure change from said first mentioned means to said spool valve.

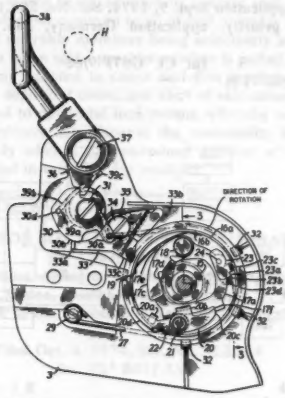


3,982,616

LATCH OPERATED CENTRIFUGALLY RELEASED SAFETY CLUTCH FOR SAWS

Edward J. Bidanset, Amawalk, N.Y., assignor to Textron, Inc., Providence, R.I.

Filed July 25, 1975, Ser. No. 599,059
Int. Cl.² F16D 21/08, 67/02
U.S. Cl. 192—104 C 14 Claims



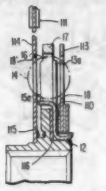
1. A safety coupling comprising a first rotatable member having at least one abutment, a second rotatable member adjacent said first rotatable member and coaxial therewith, pawl means pivotally mounted eccentrically on said second rotatable member for movement between a position in which it engages said abutment to provide a driving connection between said first and second rotatable members and a position in which it is disengaged from said abutment, first latch means for releasably holding said pawl means in engaged position, means for releasing said first latch means for movement of said pawl means to disengaged position and second latch means for thereupon preventing reengagement of said pawl means with said abutment.

3,982,617

CLUTCH DISC FOR MAIN CLUTCHES OF MOTOR VEHICLES

Gunter Worner, Rommelshausen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Apr. 15, 1974, Ser. No. 460,999
Claims priority, application Germany, Apr. 14, 1973, 2318907
Int. Cl.² F16D 3/14
U.S. Cl. 192—106.2 17 Claims



1. In a clutch disc arrangement for main clutches which includes a hub means, a flange on said hub means, a disc means operatively connected with the flange of the hub means so as to permit a predetermined rotation of said disc means relative to said hub means, side plate means, means for rigidly connecting said side plate means with said disc means, friction linings provided on said disc means, a first set of window means provided in said hub flange, a second set of window means provided in said disc means in alignment with said first set of window means, a third set of window means provided in said side plate means in alignment with said first and second set of window means, at least two spring means each of which is respectively arranged in the window means of said flange, said disc means, and said side plate means, and at least two friction means for the damping of the clutch disc arrangement, the improvement comprising: a control plate means for determining the starting point of operation of at least one of said friction means, said control plate means being mounted on said hub means so as to permit limited relative rotation therebetween, said control plate means including two radially extending arms provided on said control plate means at approximately mutually opposite sides thereof, each of said radially extending arms respectively abutting only one end of said at least two spring means, the respective ends of the spring means abutting the radially extending arms being oppositely disposed with respect to each other in relation to a direction of rotation of said hub means relative to said disc means, and a further means is provided on said control plate means extending into one of said window means of said first set of window means provided at the flange for limiting the relative rotation between said hub means and said control plate means.

3,982,618

BRAKE PROVIDED WITH GRAVITY-FEED AUTOMATIC SUPPLEMENTARY-COOLING CONTROL

Joachim Horsch, Lombard, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Oct. 24, 1975, Ser. No. 625,450
Int. Cl.² F16D 67/04, 13/72
U.S. Cl. 192—113 B 14 Claims

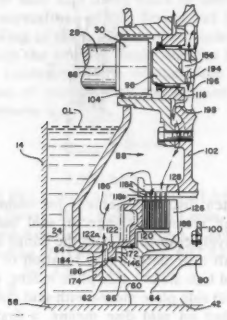
1. In a vehicle having a frame defining a wet sump and rotatably mounting therein a connected-together output shaft and output member, said shaft being slightly above the designed lubricant level in the wet sump:

an improved fixed drive-housing;

said drive-housing adapted to operate partly immersed in the wet sump and operatively surround the output member in a manner to provide a rotatable mounting for the output member and output shaft;

said drive-housing including therein constantly stationary and constantly rotatable members, selectively actuated clutch-brake friction engaging means which when engaged brake or clutch the output member selectively to the stationary or rotatable member to be set at rest or in motion thereby, and hydraulic pistons including a brake piston for the brake friction engaging means, and effective by selective engagement to actuate the clutch-brake friction engaging means to set the output member at rest or in motion as described;

first induced-flow passage means penetrating through the wall of said housing, and in open communication with the



interior of the latter, and effective on the dry sump principle to conduct any accumulated lubricant therefrom for induced discharge into the surrounding wet sump; and

second gravity-flow passage means penetrating through the wall of said housing at a submerged point so as to be maintained always below said designed lubricant level, and in controlled communication at said second passage point with the interior of the housing for affording controlled gravity flow of wet sump lubricant in-feed for cooling, and effective to conduct the in-fed flow of lubricant into the driving housing interior to at least said brake friction engaging means for gravity lubrication and cooling of same.

3,982,619

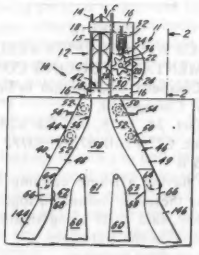
FLOW CONTROL APPARATUS AND METHOD

Walter Joseph Sieverin, Buffalo Grove, and Donald Henry Ruge, Crystal Lake, both of Ill., assignors to American Can Company, Greenwich, Conn.

Filed Oct. 1, 1975, Ser. No. 618,424

Int. Cl.² B65G *11/20*

U.S. Cl. 193—31 R **7 Claims**



1. A flow control apparatus for controlling the flow of gravity fed substantially cylindrical objects through the path of a gravity runway, which comprises:

an assembly mountable onto the gravity runway; the assembly including

engaging means communicating with the gravity runway path for successively engaging and releasing each respective gravity fed substantially cylindrical object that necessively flows through the gravity runway,

sensing means for sensing each engagement of the engaging means with each of the objects,

signal generating means cooperative with the sensing means for generating an electrical pulse signal whose amplitude signifies the duration of each engagement of the engaging means with an object,

means connected to the signal generating means for pre-setting a threshold pulse signal amplitude level, for detecting the amplitude level of the generated pulse signal and the threshold level, and for comparing them and thereby controlling the duration of the pulse signal when the generated level exceeds the threshold level, and

means connected to the threshold setting and controlling means, and to the engaging means, for utilizing the controlled pulse signal for controlling the duration of the engaging means,

sending means connected to the threshold setting and controlling means, and to the utilizing means, for sending the controlled pulse signal to the engaging means for controlling the duration of the engaging of the engaging means, each of said means operating in synchronism for preselectedly controlling the flow of gravity fed objects through, and the output flow of objects from, the gravity runway.

3,982,620

COIN COMPUTING APPARATUS

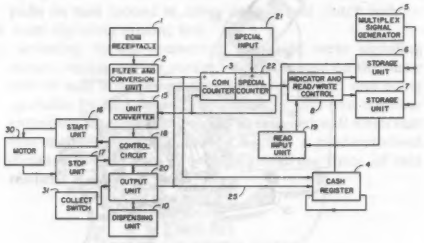
Dieter Kortenhaus, Bingen, Germany, assignor to NSM Apparatebau GmbH Kommanditgesellschaft, Bingen Germany

Continuation-in-part of Ser. No. 325,675, Jan. 22, 1973. This application Sept. 9, 1974, Ser. No. 504,128

Claims priority, application Germany, Jan. 25, 1972, 2203392

Int. Cl.² G07F *9/08*

U.S. Cl. 194—1 N **11 Claims**



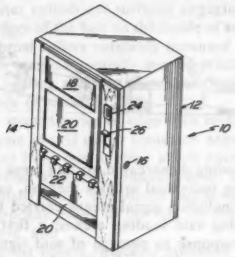
1. An apparatus for computing coin related data comprising means for receiving coins, shift register means to act as temporary storing means, means responsive to the receipt of coins for producing and storing data corresponding to coin units in said temporary storing shift register means, magnetic core storage means to act as permanent storing means, and control means for continually updating data stored in said permanent storing magnetic core storage means from said temporary storing shift register means, said control means comprising means for reading data from said permanent storing magnetic core storage means and writing it in said temporary storing shift register means in response to cessation of a condition interfering with storage in said temporary storing shift register means, said reading means comprising means for subsequently storing the read-out data again in said permanent storing means, said control means further comprising means for eras-

ing data stored in said permanent storing magnetic core storage means in response to the reading thereof by said reading means and also simultaneously with the updating of data therein by said means for updating data.

3,982,621
VENDING MACHINE

Harry E. Galin, Willow Grove, Pa., assignor to Universal Vendors, Inc., Fort Washington, Pa.

Filed Mar. 13, 1975, Ser. No. 558,196
Int. Cl.[2] G07F 11/00
U.S. Cl. 194—1 G **8 Claims**



1. A vending machine having a plurality of merchandise columns, a manually operable member for dispensing said merchandise associated with each column, lockmeans preventing dispensing operation of all of the manually operable members until a predetermined amount of coins has been deposited in said vending machine, first sensing means responsive to a first amount of coins deposited in the vending machine and second sensing means responsive to a second amount of coins deposited in the vending machine, each of said sensing means being adapted to contact said deposited coins, a slidable bar common to all of said operable members, each of said operable members being selectively adapted to slide said bar when said operable member is pulled, said slidable bar being adapted to cause said first sensing means to contact said deposited coins, and each of said sensing means being adapted to open said lock means, whereby one of said operable members can dispense the commodity associated therewith only when a predetermined amount of coins has been deposited in said vending machine.

3,982,622
ACTUATOR MECHANISMS FOR WIRE MATRIX PRINTERS

Joseph A. Bellino, Arlington Heights; David G. Geis, Chicago; Ingard B. Hodne, Northbrook, and Arthur F. Lindberg, Chicago, all of Ill., assignors to Teletype Corporation, Skokie, Ill.

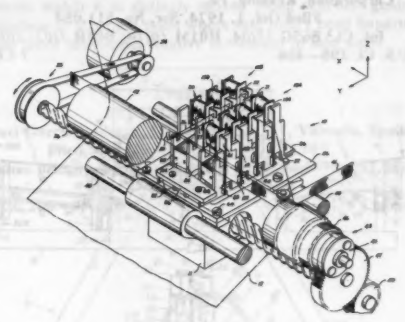
Filed Oct. 4, 1974, Ser. No. 512,264
Int. Cl.[2] B41J 3/04
U.S. Cl. 197—1 R **41 Claims**

1. In a wire matrix printer, an actuator for selectively impacting an end of a print wire on a recording medium, comprising:

a. an armature of ferromagnetic material having an elongated body to which the print wire is mounted at a first end thereof, the armature being rotatable in a circular arc about an axis of rotation adjacent to a second end thereof and perpendicular to the body, for moving the print wire end toward and away from the recording medium;

b. a rotatable torsion rod attached to the second end of the armature and extending parallel to the axis of rotation of the armature, the armature assuming a neutral position when the torsion rod is free of torsional stress;

c. means for normally magnetically attracting the armature to a rest position by rotating the armature on the axis away from the neutral position to move the wire end away from the recording medium and to twist the torsion rod to torsionally stress the torsion rod; and

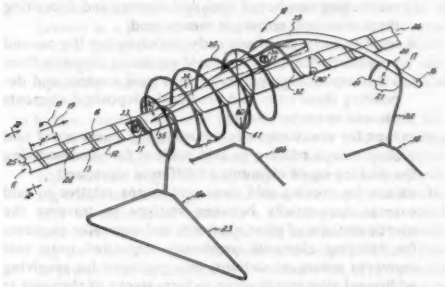


d. means for neutralizing the magnetic attraction so that the torsionally stressed rod rotates the armature toward the neutral position to drive the print wire end toward the recording medium for impacting the wire end thereon.

3,982,623
PICK OFF DEVICE

Laddie DePas, and Stanley T. Wheeler, both of Louisville, Ky., assignors to W. M. Cissell Manufacturing Company, Louisville, Ky.

Filed Dec. 11, 1975, Ser. No. 639,715
Int. Cl.[2] B65G 47/36
U.S. Cl. 198—362 **6 Claims**



1. An improved pick off device adapted to transfer open mouth hook type work supports from an extended length screw conveyor onto a branch support member, said support member branching off from said screw conveyor at an angle relative thereto, said device comprising:

a helix surrounding and spaced from said screw conveyor's threaded rod, said helix being fixed in place on said threaded rod for rotation therewith, and

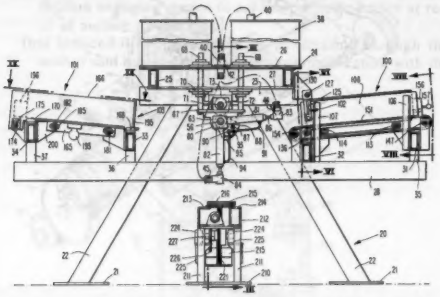
a pick off finger positioned generally longitudinally of said screw conveyor between said helix and said threaded rod, said pick off finger being connected at one end to said branch support member and said finger's tip being closely adjacent the surface of said threaded rod at the other end, said work supports being driven in a positive manner by said helix up onto said pick off finger for transferring same from said screw conveyor onto said branch support member upon rotation of said screw conveyor.

3,982,624

APPARATUS AND METHOD FOR HANDLING AND STACKING BATTERY PLATES AND THE LIKE

William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.

Filed Oct. 1, 1974, Ser. No. 511,054
Int. Cl.[2] B65G 57/04; H01M 10/14; B65H 1/02, 3/08
U.S. Cl. 198—486 7 Claims



1. In the battery art, apparatus for continuously manufacturing sandwiches of a first predetermined number of battery plate elements and a second predetermined number of battery separator elements with the plate elements and separator elements being in alternately adjacent relation, comprising:

a. a plurality of sources of plate elements disposed at stations along a conveyor means;

b. a plurality of sources of separator elements disposed at stations along said conveyor means;

c. means for simultaneously adjusting the sizes of said element source stations for accomodating elements of different sizes;

d. element pickup means for alternately:

i. substantially simultaneously withdrawing the first predetermined number of said plate elements from a corresponding number of their said sources and depositing them onto said conveyor means, and

ii. substantially simultaneously withdrawing the second predetermined number of said separator elements from a corresponding number of their said sources and depositing them onto said previously deposited elements on said conveyor means;

e. means for simultaneously adjusting the positions of said pickup means relative to said stations for accomodating the picking-up of elements of different sizes; and

f. means for moving said conveyor means relative to said sources sequentially between stations to traverse the source stations of plate elements and separator elements for bringing elements previously deposited onto said conveyor means at stations, into positions for receiving additional elements thereon to form stacks of elements at said stations.

3,982,625

SORTER INDUCTION SYSTEM

Edward A. Wentz, Gaithersburg, and Wayne Douglas Pyles, Frederick, both of Md., assignors to American Chain & Cable Company, Inc., Bridgeport, Conn.

Continuation of Ser. No. 69,404, Sept. 3, 1971, abandoned. This application Jan. 30, 1973, Ser. No. 328,020
Int. Cl. B65g 37/00
U.S. Cl. 198—572 16 Claims

1. A conveyor system comprising the combination of main conveyor and an induction conveyor for discharging articles to said main conveyor; said induction conveyor comprising a discharge end whereat articles are discharged on to said main conveyor; pivotal support means for said induction conveyor whereby said induction conveyor is free to oscillate; said induction conveyor being disposed realtive to said main conveyor so that in the course of oscillation said discharge end moves through an arc adjacent to said main conveyor to transfer articles on to said main conveyor during arcuate traverse; actuating means for effecting oscillation wherein said discharge end moves through said arc at a speed approximating the main conveyor speed so that articles discharged have an effective speed aproximating that of said main conveyor in the direction of movement thereof during transfer; said induction conveyor comprising a loading belt and a spitter belt in tandem wherein articles are loaded on said loading belt to pass to said spitter belt to be transferred to said main conveyor; said discharge end of said induction conveyor being the downstream end of said spitter belt; and means for operating said loading belt at a rate synchronized with the speed of said main

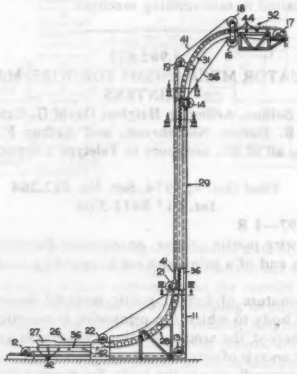
conveyor, including demarcated loading areas on said loading belt for placing individual articles thereon, said areas being equal in size, including signal means carried by said loading belt demarcating said loading means; a first sensor means operative in response to passage of said signal means; said main conveyor comprising a plurality of spaced load receiving means for receiving individual articles; a second sensor means operative to signal passage of individual load receiving means; control means responsive to a time difference in the signals of said two sensor means to synchronize the position of said loading belt with the position of a load receiving means whereby articles are certain of transfer on to a load receiving means during arcuate traverse of said downstream end of said spitter belt.

3,982,626

BELT ELEVATOR FOR BULK MATERIAL

Bharat C. Mehta, Belleville, Canada, assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed June 5, 1975, Ser. No. 584,135
Int. Cl.[2] B65G 15/14
U.S. Cl. 198—626 8 Claims



1. In a belt elevator for bulk material of the type having a frame, a receiving zone and a discharge zone, the combination comprising:

belt pulleys mounted on said frame,

a pair of normally flat flexible belts of substantially uniform thickness cooperatively engaging said pulleys and disposed in cooperative confronting engagement with one

another in an elevation zone, and in upper and lower curved transition zones, said belts being laterally flexible to accommodate changes in volume of material conveyed thereby,

sets of opposed edge rollers rotatably mounted on said frame disposed on parallel transverse axes having radially outward facing cylindrical surfaces urging the confronting faces of the edges of said belts into sealing engagement in said elevation zone,

two laterally spaced series of edge rolls rotatably mounted on said frame in said lower transition zone circumferentially spaced from one another all on parallel transverse axes to define a first gradual curve, said edge rolls having radially outer cylindrical surfaces engaging the laterally opposite edges of the belt on the inside of said first curve,

a series of thrust rollers rotatably mounted on said frame disposed in circumferentially spaced relation to one another and bearing against the central portion of the belt on the inside of said first curve,

two laterally spaced series of edge rolls rotatably mounted on said frame in said upper transition zone circumferentially spaced from one another all on parallel transverse axes to define a second gradual curve, said edge rolls having radially outer cylindrical surfaces engaging the laterally opposite edges of the belt on the inside of said second curve, and

a series of thrust rollers rotatably mounted on said frame disposed in circumferentially spaced relation to one another and bearing against the central portion of said first belt,

said edge rolls and said edge rollers having parallel axes and providing a smooth face-to-face transfer of said belt edges between said edge rolls of said transition zones and said edge rollers of said elevation zone.

3,982,627

AUTOMATIC WAFER ORIENTING APPARATUS

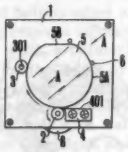
Junji Isohata, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 11, 1975, Ser. No. 557,294

Claims priority, application Japan, Mar. 13, 1974, 49-28843

Int. Cl.² B65G 47/24

U.S. Cl. 214—1 Q **21 Claims**



1. An apparatus for automatically orienting a wafer to a desired position, said wafer having an orientation reference peripheral portion distinctively formed with respect to the other peripheral portion and having a pair of resultant edges formed in the periphery at the intersecting points between said orientation reference portion and the other portion, said apparatus comprising;

a. a support plate for receiving and holding said wafer,

b. a rotary head positioned on said support plate upon engagement with the periphery of said wafer to apply a rotative movement to said wafer,

c. an idler arranged on said support plate in spaced apart relation to said rotary head to define an area of movement of said wafer as the wafer is rotated by said rotary head,

d. a guide abutment having a flat guide surface for guiding one of said the pair of edges in a linear direction positioned adjacent said rotary head on the opposite side of said rotary head to said idler to interact with said edge in such a manner that as the wafer is rotated by said rotary head, said edge strikes said flat guide surface at a point from which it is slidingly moved along said flat guide surface to a certain point where said rotary head imparts no more substantial rotative movement to said wafer.

3,982,628

ETUI FOR JEWELRY

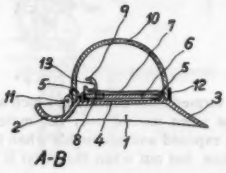
Manuel Garcia Rodenas, Salvador Lluch, 21, Valencia, Spain

Filed Mar. 26, 1975, Ser. No. 562,129

Claims priority, application Spain, Nov. 26, 1974, 207,851

Int. Cl.² B65D 43/16, 25/10

U.S. Cl. 206—45.14 **4 Claims**



1. A jewelry case in the form of a woman's hat of the pamela type, in miniature, for containing and displaying rings, bracelets and other articles of jewelry comprising:

a round base having a substantially flat horizontal wall surrounded by a peripheral flange half of which is curved upwardly and half of which is curved downwardly in the shape of a hat brim, a substantially vertical lip extending upwardly from the periphery of said horizontal wall, a plate supported on said horizontal wall within said vertical lip on said base, a hook fixedly attached to said plate, said hook having a rib protruding from the concave side of said hook for engaging and supporting an article of jewelry in a position for display, said plate being covered with a lining material with the hook extending exteriorly through said lining material, and a half hinge on said upwardly curved half of said flange adjacent said vertical lip; and

a hollow, rounded cover in the form of the crown of the hat, a hat band disposed around said cover and extending below the edge thereof, and a half hinge on said cover adjacent said edge, said half hinge of said cover cooperating with said half hinge of said base whereupon said cover may be articulated between a closed position at which said cover rests on said flange with said hat band concealing the line of contact between said cover and said base to present the apearance of a woman's hat of the pamela type, and an open position at which said cover is swung back to expose said lined plate and the article of jewelry supported thereon.

3,982,629

MATCH BOOK

Milton J. Duenke, 14796 Sugarwood Trails, Chesterfield, Mo. 63017

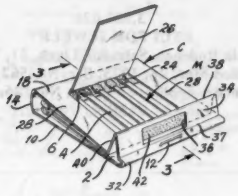
Filed July 9, 1975, Ser. No. 594,369

Int. Cl.² A24F 27/12, 27/00

U.S. Cl. 206—106 **10 Claims**

1. A match book comprising: a cover formed from a plurality of connected panels which move to a closed position, said plurality of panels including a front panel and an intermediate panel which is connected to one end of the front panel along a first fold line such that movement of the front panel in one direction will change the inclination of the intermediate panel relative to the front panel; a plurality of match sticks within the cover such that the cover surrounds and protects the

match sticks, the match sticks being arranged in at least one row over which the front panel lies with the sticks extending generally parallel to said one direction of movement for the front panel, the match sticks having heads formed from a combustible material; and a scratch surface on the intermediate panel and formed from a material which will cause a match head to ignite when moved over the material, the scratch surface being exposed and accessible when the cover is in its closed condition, but not when the cover is moved out of its closed position.



3,982,630

PACKAGE FOR DENTAL ROOT CANAL AND THE LIKE INSTRUMENTS

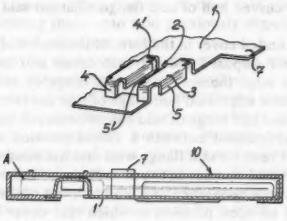
Marcel Garnier, Besancon, France, assignor to Micro-Mega S.A., France

Filed Dec. 6, 1974, Ser. No. 530,375

Claims priority, application France, Dec. 14, 1973, 73.44932

Int. Cl.[2] B65D *85/20, 1/36*

U.S. Cl. 206—369 5 Claims



4. A package for dental instruments, comprising: a base plate comprised of a main part, a marginal edge part adjacent thereto, and a plurality of protuberances integral with said main part and said marginal edge part of said base plate and spaced apart along the general direction of said marginal edge part; said protuberances being formed by generally parallel protruding bridges each including respective narrow end portions attached to said main part and said marginal edge part, and a widened central part having edges folded down toward said base plate to form resilient side walls, adjacent pairs of said protuberances disposed with their respective resilient side walls facing one another to define means for gripping an instrument handle therebetween; and a cover movable from a position mounted on and covering the base plate to a position uncovering the base plate.

3,982,631

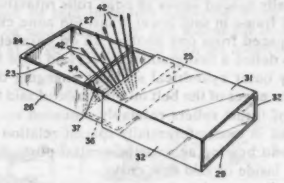
DISPENSING CASE FOR NEEDLES OR THE LIKE

I. Jordan Kunik, and Maurice Goodman, Jr., both of New York, N.Y., assignors to I. Jordan Kunik and Maurice Goodman, Jr., both of New York, N.Y., part interest to each

Filed Oct. 17, 1974, Ser. No. 515,497

Int. Cl.[2] A41H *31/00*; B65D *85/24*

U.S. Cl. 206—380 8 Claims



1. A dispenser container for magnetizable elements such as needles, tools, and the like, comprising an open top rectangular box having spaced side walls and spaced end walls, a vertical partition in said box and disposed transversely relative thereto intermediate said end walls, a magnet element, a strip of fabric forming a flexible hinge between said partition and said magnet for pivotal action of the latter relative to the former, one portion of said strip being bonded to the rear surface of said partition and the other portion of said strip being bonded to the lower surface of said magnet that pivotally opposes said rear surface of said partition, said magnetizable elements making unobstructed operational contact with the free upper surface of said magnet.

3,982,632

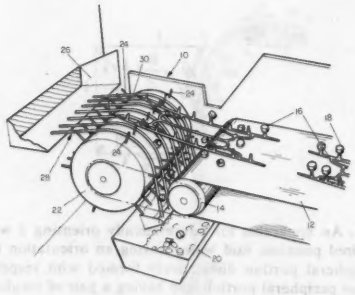
THERMOPLASTIC INJECTION RUNNER TRANSFER SYSTEM

Isrrael M. DeLeon, West Chicago, and Edward D. Thompson, South Elgin, both of Ill., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed June 23, 1975, Ser. No. 589,215

Int. Cl.[2] B07C *9/00*

U.S. Cl. 209—75 1 Claim



1. A transfer system for guiding a thermoplastic injection runner from a conveyor into a collection hopper comprising, in combination:

a transfer drum rotatably mounted between said conveyor and said collection hopper;

a plurality of spike members attached to and extending outwardly from said transfer drum for engaging said runner as it leaves said conveyor and moving said runner into said collection hopper; and

a separation grid means, including a plurality of rod members spaced from and overlying said rotating transfer

drum and extending from a location adjacent said conveyor to a location adjacent said collection hopper, to provide a guide path for said runner as it is moved by said spike members on said rotating transfer drum toward said collection hopper, said rod members being spaced from each other to allow said spike members on said rotating transfer drum to pass therebetween.

3,982,633

DISPLAY DEVICE

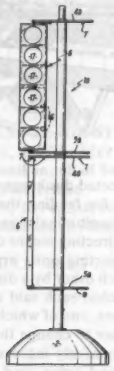
John James Pennington, Dalefords Cottage, Dalefords Lane, Whitegate, near Northwich, Cheshire, England

Filed Jan. 2, 1975, Ser. No. 537,855

Claims priority, application United Kingdom, Jan. 4, 1974, 406/74

Int. Cl.[2] B65D *85/62*; E05B *73/00*

U.S. Cl. 211—4 3 Claims



1. A display device for displaying a plurality of articles comprising a lockable compartmentalised container formed from two container parts mounted on a support means:

each container part being in the form of an elongated box structure having: front and back elongated walls each having short top and bottom edges and long side edges; a top wall extending between adjacent said top edges of the front and back walls, a bottom wall extending between adjacent said bottom edges of the front and back walls; a side wall extending between one pair of adjacent side edges of the front and back walls, an article receiving side opening opposite said side wall and between the other pair of adjacent side edges, and at least one intermediate wall extending between the front and back walls and parallel to the top and bottom walls so as to divide the box structure into a plurality of open sided compartments for receiving said articles to be displayed, the width of each said side wall, and of each said side wall opening, being less than the width of each said front wall and back wall whereby said compartments are each of generally flat rectangular form and the front and back walls being formed so as to permit inspection of articles in the compartments through the front and back walls,

the two container parts being connected with each other by connection means for movement from an open position with both said other pairs of adjacent side edges spaced apart from each other to enable an article to be received in the side openings thereof to a closed position with both said other pairs of adjacent side edges abutting each other to enable each said part to form a closure for the opening, locking means being provided for locking the container parts in said closed position.

3,982,634

METHOD AND APPARATUS FOR ERECTING A VERTICAL STRUCTURE

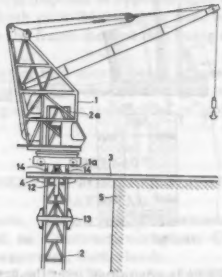
Moritugu Miyazaki, Tokyo, Japan, assignor to Mitsui Shipbuilding and Engineering Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 417,912, Nov. 21, 1973, abandoned. This application July 16, 1975, Ser. No. 596,573

Claims priority, application Japan, Nov. 29, 1972, 47-120138

Int. Cl.[2] B66C *15/06*

U.S. Cl. 212—1 2 Claims



1. Apparatus for use in completing the erection of a structure partially-erected to a level, comprising:

a temporary tower projecting upwardly alongside the partially-erected portion of the structure to a location above said level, said tower having an upper section above said level, a lower section below said level, and means releasably connecting said upper and lower sections to afford lateral disengagement of one from the other;

a superstructure assembly transferable onto said partially-erected structure for use thereon, said superstructure assembly including:

a jib crane, tower climbing means carried by said jib crane for engaging the tower to advance said crane vertically therealong, and traveling means supporting said crane for movement horizontally along a surface; said tower climbing means including upper tower locking means, lower tower locking means below said upper tower locking means, extensible linkage means projecting upwardly toward said superstructure assembly from said lower tower locking means; and means releasably securing said extensible linkage means to said superstructure assembly; and

horizontally-disposed rail means supported by said lower section of said tower and by said partially-erected structure for providing a temporary bridge across said tower and said structure at said level and providing said support surface for said crane traveling means;

whereby the upper section of the tower can be separated from the lower section thereof and moved laterally with the superstructure assembly on the rail means onto the partially-erected structure to enable the jib crane to be used to complete the erection of the structure.

3,982,635

FEEDING AND DISCHARGING APPARATUS FOR BLOW MOLDING OPERATION

Charles L. D. Chin, Avon; William R. Wiggins, Forestville, and Jon D. Yonko, Vernon, all of Conn., assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 27, 1975, Ser. No. 544,052

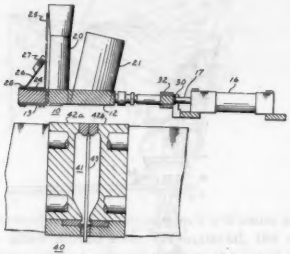
Int. Cl.[2] B65B *39/00*; B29D *23/03*

U.S. Cl. 214—1 BB 14 Claims

1. Apparatus for feeding workpieces to and discharging articles from a blow mold comprising:

a. base means above a blow mold having at least one pair of adjacent feed and discharge openings and including stop means associated with said feed opening for temporarily obstructing passage of a workpiece through said feed opening;

b. means connected to said base means for reciprocating said base means laterally with respect to said mold to position the center of said feed opening over the center of said mold when feeding a workpiece and in position to receive a new workpiece when the center of said discharge opening is positioned over the center of said mold for receiving a discharged article;



c. means in the path of said base means for delimiting reciprocating movement of said stop means; and

d. resilient means associated with said base means to allow sufficient continued movement of the portion of said base means containing said opening after said stop means has stopped to remove the obstruction at said feed opening provided by said stop means and thereby allow said workpiece to continue through said feed opening.

3,982,636

CAR LIFTING APPARATUS

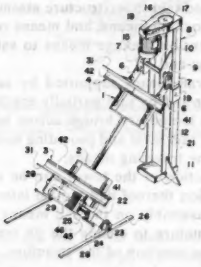
Seiji Furuto, 865, Suzukicho 2-chome, Kodaira, Tokyo, Japan

Filed July 17, 1975, Ser. No. 596,659

Claims priority, application Japan, July 26, 1974, 49-85692; Apr. 2, 1975, 50-40139

Int. Cl.² B23Q *3/18*; B66F *3/08*

U.S. Cl. 214—1 A **8 Claims**



1. A car lifting apparatus comprising means for carrying a car thereon and having a support member which engages the car, means for lifting one end of said carrier means upward, means for connecting said one end of said carrier with said lifting means, means for guiding the other end of said carrier means in the direction of said lifting means as the latter operates, and means for connecting said other end of said carrier means with said guide means, said latter connecting means including auxiliary lifting means lifting said other end of said carrier means upward.

3,982,637

DEVICE FOR DIRECTED DISCHARGE OF CONICAL ARTICLES

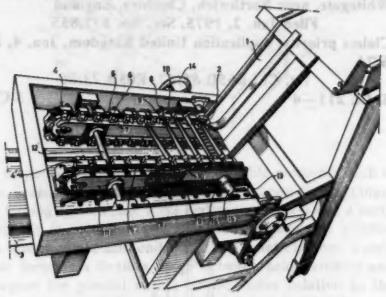
Johannes Antonius Roetgerink, Hengelo, Netherlands, assignor to Machinefabriek M. Brouwer & Co. B.V., Hengelo, Netherlands

Filed Nov. 8, 1974, Ser. No. 522,090

Claims priority, application Netherlands, Nov. 15, 1973, 7315703

Int. Cl.² B65G *57/08*

U.S. Cl. 214—6 D **21 Claims**



1. Apparatus for directed discharge of conical articles comprising feeding means for feeding the articles in a direction perpendicular to the longitudinal direction of said articles to directing means, said directing means comprising a plurality of opposed pairs of supporting units arranged in juxtaposition and separated from each other by a distance corresponding to the length of said articles, each said unit comprising at least two supporting members, one of which is operatively movable with respect to the other to change their mutual spacing, and guide means for progressively increasing the mutual spacing from a first to a second value, and back to its first value whereby, first one end of the article is released thus orienting the article about the supported other end of the article and then releasing the said other end of the article.

3,982,638

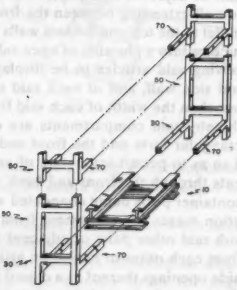
DEVICE FOR CONVERTING PALLETS INTO A STORAGE RACK

Frederick W. Lamson, 725 S. Glenhurst Drive, Birmingham, Mich. 48009

Filed May 17, 1974, Ser. No. 470,817

Int. Cl.² B65G *1/14*

U.S. Cl. 214—10.5 R **7 Claims**



1. For use in stacking pallets formed by fixing the lower flange faces of a first array of parallel, horizontal I-bars to the

upper flange faces of a second array of parallel, horizontal I-bars transverse to the first, a device comprising:

a pair of upright I-bars rigidly secured in parallel spaced relationship with their webs face-to-face;

a first pair off parallel, horizontal members rigidly fixed at one end to one of said upright I-bars proximate its lower end, said first pair of horizontal members being spaced to receive the web of one of the pallet first array I-bars therebetween with the lower faces of the upper flange of said first array I-bar resting on the upper faces of said first pair of horizontal members;

a second pair of parallel, horizontal members rigidly fixed at one end to the other of said upright I-bars proximate its lower end, said second pair of horizontal members being spaced to receive the web of another of the pallet first array I-bars therebetween with the lower faces of the upper flance of said other first array I-bar resting on the upper faces of said second pair of horizontal members;

means on said upright I-bars for securing a similar pair or upright I-bars mounted in tandem thereon against relative lateral motion with respect to said upright I-bars; and

means on at least one of said horizontal members for detachably coupling said one of said horizontal members to the pallet.

3,982,639

SHELF STORAGE SYSTEM

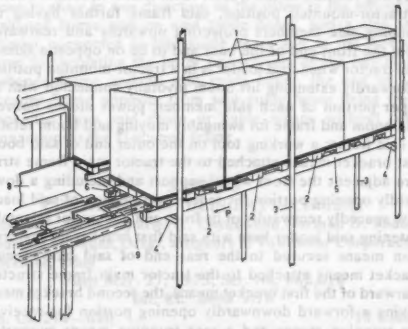
Hans Rudolf Haldimann, Zurich; Max Buehler, Thalwil, and Patrick R. Brown, Zumikon, all of Switzerland, assignors to Weelpal, A.G., Zug, Switzerland

Filed Sept. 3, 1974, Ser. No. 502,841

Claims priority, application Switzerland, Sept. 6, 1973, 13042/73

Int. Cl.[2] B65G *1/06*

U.S. Cl. 214—16.4 C **6 Claims**



1. In a shelf storage and transportation system for goods on pallets having rollers on a base for the pallets which are supported on a plurality of shelves in a stand and having a stop means at the end of a shelf to act only on the conveyer vehicle, that improvement consisting of:

a rectangular frame formed of vertical members connected to each other by horizontally extending transverse members to form shelves;

a pair of longitudinal trackway members, one on each side of said frame, and supported on said transverse members;

one end of each said trackway members being higher than the other end to form a gradient in the direction of the receiving end of the shelf;

a stop and positioning mechanism at the receiving end of said shelf on said trackway members to stop and position pallets on said trackway;

braking means mounted on said trackway members to regulate the speed of pallets rolling on said trackway member;

a mobile conveyer vehicle fitted with a transfer mechanism for loading and unloading said shelves, said conveyer vehicle fitted with four wheels within opposite sides of a four sided frame for supporting said pallet as a unit on a slip resistant supporting part of said frame;

wheel casings at said opposite sides of said frame to rotatably support said wheel at a small distance of about 1 to 2 centimeters above the lower contacting surface of said wheels whereby the bottom of the pallet is close to said trackway members;

means for changing the position of the mobile conveyer vehicle and pallet unit within the system comprising two sets of supports disposed at opposite sides respectively of the frame, both parts having their axes of rotation disposed above the frame the first part being said four sided frame; and,

the second part of said means being adapted to be interchangeably supported on said first part and formed to receive the goods to be transported or stored.

3,982,640

SILO OR RESERVOIR FOR FREE FLOWING SOLID MATERIAL

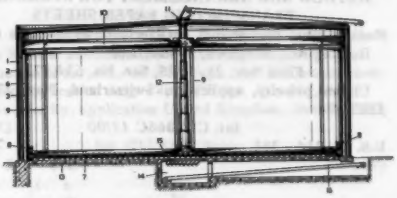
Drewes Jan Nauta, Wormerveer, Netherlands, assignor to Machinefabriek en Constructiewerkplaats Gebr. Klinkenberg B.V., Wormerveer, Netherlands

Filed Feb. 6, 1975, Ser. No. 547,571

Claims priority, application Netherlands, Feb. 8, 1974, 7401790

Int. Cl.[2] B65G *65/32*

U.S. Cl. 214—17 CB **4 Claims**



1. A silo or reservoir for free flowing solid material, consisting of at least one vertical side wall which is preferably circle symmetrical and connected with a number of upstanding supporting columns of a supporting framework, a floor and a roof structure, a filling means and a discharge means in the roof and in the floor respectively and a horizontal distributor arrangement provided inside the silo for a rotational and up and down movement characterized in that the side wall (3) is firmly connected with a number of continuously extending ring-like annular elements (4) arranged in spaced relationship one above the other and so shaped as to resist outward radial pressure, said annular elements (4) being freely supported by brackets (5) which are connected to the inside of the supporting columns (2) of the supporting framework and means for preventing said annular elements from sliding off said brackets.

3,982,641

HOPPER CAR DOOR ACTUATING MECHANISM

Roy W. Miller, Highland, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Filed Mar. 6, 1975, Ser. No. 555,772

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.[2] B65G *67/24*

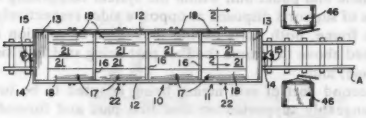
U.S. Cl. 214—58 **8 Claims**

1. For a railway hopper car having a body structure and a

hopper, bottom door dump means for discharging material from said hopper in an open position,

door actuating mechanism for moving said door between open and closed positions including a bell shaped crank arm pivotally mounted on said structure and having an arm position pivotally connected to said door, cam follower means on said arm, the improvement comprising;

a cam structure positioned adjacent a railway track on which said car is travelling, said structure including a base having an upright pedestal,



a horizontal cam member supported on said pedestal and including a vertical cam surface,

said cam follower means during movement of said car engaging said vertical cam surface whereby said arm is pivotally moved and said door is opened,

a second auxiliary cam supported on said pedestal, and including a second vertical cam surface and second follower means on said arm engaging said second cam during engagement between said first cam follower and said first cam whereby an additional force is initiated to pivot said arm to said open position of said door means.

3,982,642

METHOD AND ARRANGEMENT FOR STORING AND TRANSPORTING PAPER SHEETS

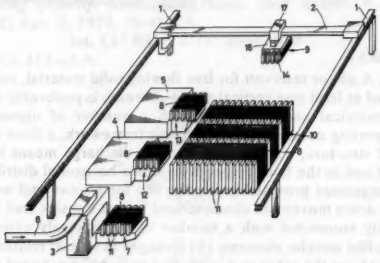
Hans Müller, Barenhubel, Switzerland, assignor to Grapha-Holding AG, Hergiswil, Switzerland

Filed Nov. 21, 1975, Ser. No. 634,173

Claims priority, application Switzerland, Nov. 27, 1974, 15821/74

Int. Cl.² B66C *17/00*

U.S. Cl. 214—301 **7 Claims**



1. A method of storing and transporting individual paper sheets which abut with faces thereof against each other to form an elongated staple of sheets, comprising the steps of placing a staple of sheets compressed in longitudinal direction to a predetermined length onto a planar substantial horizontal support surface of a first magazine between upright stationary support members thereon spaced from each other a distance slightly greater than said predetermined length so that said support members will engage endmost sheets of the staple; gripping the endmost sheets of the staple with clamping jaws arranged to pass by said support members and further compressing the staple in longitudinal direction by the clamping jaws to form a self-supporting body from said sheets; removing said body by means of said clamping jaws from between said support members of said first magazine; transporting said body held by the clamping jaws between support members of another magazine spaced from each other the same distance as in said first magazine and placing the body onto the planar support surface of the second magazine; and moving the clamping jaws away from each other and from said endmost sheets of the staple to relax the latter until the endmost sheets of the staple engage the support members of the second magazine to thereby hold the staple in slightly compressed condition between the support members of said second magazine.

3,982,643

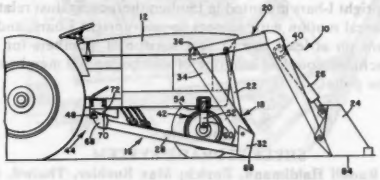
POWER LOADER

William Roderick MacGregor, and Dalton Harold Spicer, both of Welland, Canada, assignors to Deere & Company, Moline, Ill.

Filed June 30, 1975, Ser. No. 591,353

Int. Cl.² E02F *3/72*

U.S. Cl. 214—131 A **8 Claims**



1. A detachable power loader for use on a tractor having a main frame structure including front and rear wheel support, said loader having a fore-and-aft elongated frame including a rectangularly-shaped base having front and rear ends and adapted to rest level with and on the ground when said loader is in a self-supported parked position, and be secured in underslung relation to the tractor main frame structure when in a tractor-mounted position, said frame further having upstanding side members projecting upwardly and rearwardly from the front end of the base and to be on opposite sides of said tractor when said loader is in a tractor-mounted position; a forwardly extending lift boom pivotally connected with the upper portion of each side member; power means between said boom and frame for swingably moving said boom relative to said frame; a working tool on the outer end of said boom; first bracket means attached to the tractor main frame structure adjacent the front wheel support and including a downwardly opening portion for receiving a portion of said loader base spacedly rearwardly of its front end; means for releasably fastening said loader base with said first bracket means; trunnion means secured to the rear end of said base; second bracket means attached to the tractor main frame structure rearward of the first bracket means, the second bracket means having a forward downwardly opening portion for receiving the trunnion means and a rear trunnion means supporting portion that receives the trunnion means from the front portion; means for releasably fastening the rear end of said loader base when the trunnion means are in the rear trunnion means supporting portion; said loader having a center of mass located forwardly of said frame base member.

3,982,644

SIDE SHIFT AND SKEWING DEVICE FOR VAN CARRIER

Bobbylee Pease, Battle Creek, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

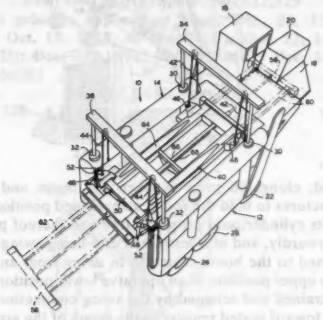
Filed May 19, 1975, Ser. No. 578,458

Int. Cl.² B60P *1/02*; B66C *1/00*

U.S. Cl. 214—394 **4 Claims**

1. In a van carrier vehicle having a horizontally extending U-shaped frame forming an open bay for embracing the load to be transported by the vehicle, a pair of transversely spaced motors mounted upon opposite legs of the U-shaped frame in each end portion thereof, lifting arch means connecting the

motors of each such pair of hoist motors above the U-shaped frame for elevation therewith, a spreader frame embraced by the U-shaped frame and connected by flexible chain or cable means to the lifting arch means for elevation therewith and with said pairs of hoist motors and load lifting means depending from opposite end portions of the spreader frame, said spreader frame being movable downwardly with the lifting arch into a position atop a container to be engaged wherein said lifting means are registrable in locking relation with upper portions of the container so that the container may be elevated within the U-shaped frame, a guide beam extending transversely through one end portion only of the spreader frame having opposite ends thereof engaging a pair of transversely spaced upright channel sections secured in opposed facing relation in one end portion of the U-shaped frame and elevatable therein, a pair of hydraulic actuator cylinders connected between opposite end portions of said guide beam and opposite sides of the spreader frame for causing said spreader frame to skew in one direction or the other in the bay of the U-shaped frame and on said guide beam, and a side shift cylinder connected to said guide beam and to the spreader frame for actuating the latter transversely of the bay of the U-shaped frame and on said guide beam, the end of said spreader frame opposite from said guide beam being freely suspended from said chain or cable means without other connection to the U-shaped frame.

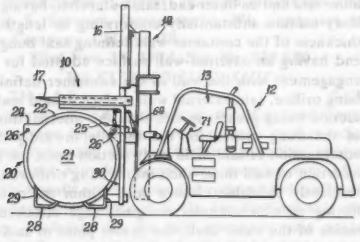


3,982,645

CONTAINER HANDLING ATTACHMENT

Thomas E. Brink; Charles R. Chelin, and Norman D. Thompson, all of Dallas, Oreg., assignors to Towmotor Corporation, Mentor, Ohio

Filed Mar. 27, 1975, Ser. No. 562,610
Int. Cl.² B66F 9/18
U.S. Cl. 214—620 **10 Claims**



1. A container handling attachment, for a lift truck having a pair of forwardly extending, vertically movable lift forks, which attachment enables such truck to handle a relatively large, horizontally disposed cylindrical object having a pair of longitudinally spaced lifting bars disposed in offsetting relation to one side of the periphery of such object, said container handling attachment comprising:

a frame having a pair of laterally spaced side frame assemblies;

means for individually mounting each of said side frame members to respective ones of said lift forks of the truck;

a pair of lifting lugs, each carried on a respective one of said side frame members and positioned for lifting engagement with a respective one of said lifting bars of the object;

latching means mounted to said lifting lugs for selectively retaining said lifting bars on said lugs, said latching means being movable from an open, nonretaining position to a closed position in which said latching means is disposed in retaining engagement with said lifting lugs about said lifting bars so as to prevent the disengagement of said bars when the latching means is in its closed position;

actuator means;

over-center linkage means interconnected between said actuator means and said latching means for moving said latching means between said open and closed positions in response to said actuator means, said linkage means having a bell crank pivotally movable in one direction upon an opening response from said actuator means and in the opposite direction upon an opening force exerted thereon through said latching means; and

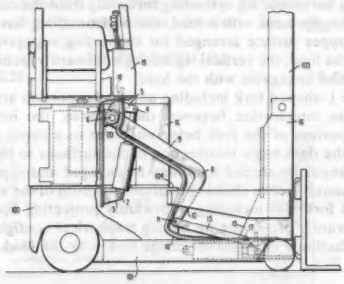
stop means secured adjacent said bell crank for engagement therewith to limit the pivotal movement of said bell crank in said opposite direction so as to prevent said opening force from opening said latching means.

3,982,646

REACH TRUCKS

Graham Edward Gaskin, Ipswich, England, assignor to Ransomes Sims & Jefferies Limited, Suffolk, England

Continuation of Ser. No. 400,545, Sept. 25, 1973, abandoned.
This application Aug. 14, 1975, Ser. No. 604,813
Claims priority, application United Kingdom, Oct. 3, 1972, 45568/72
Int. Cl.² B66F 9/10
U.S. Cl. 214—670 **4 Claims**



1. A reach truck comprising:

a frame;

a pair of parallel guides forming a lower part of said frame and mutually spaced transversely of the truck, said guides defining a first plane;

a mast supported on and reciprocably movable along said guides; and

mechanism for moving said mast along said guides between an extended and a retracted position, said mechanism including a cranked lever having a first, upright part pendantly mounted on an upper part of said frame and alongside the front thereof for rotation about a pivotal axis parallel with said first plane, and a second part extending from said first part at a location remote from said

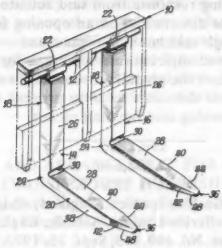
pivotal axis of said lever in the direction away from said mast, means for rotating said lever about its pivotal axis, and a link having a first pivotal connection with said mast in the vicinity of said first plane and a second pivotal connection with said second part of said lever, said second pivotal connection being in the retracted position of said mast located on the side remote from said mast of a second plane normal to said first plane and containing both said first part of said lever and said pivotal axis of said lever, the attitude of said link relative to said first plane ensuring that throughout the entire movement of said mast on extension or retraction thereof the force transmitted through said link has a major component parallel with said guides.

3,982,647

LIFT TRUCK FOR CONCRETE BLOCKS

Edward G. Teutsch, Willoughby, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Apr. 28, 1975, Ser. No. 572,245
Int. Cl.² B66F 9/14
U.S. Cl. 214—750 8 Claims



1. A carriage assembly for use on a lift truck, comprising

a carriage including a transverse mounting bar means, and at least one load supporting fork, the fork being L-shaped and including a vertical leg having means for attachment to the transverse mounting bar means of the carriage and a horizontal leg extending forwardly from the carriage for engagement with a load, the horizontal leg having a flat upper surface arranged for supporting engagement with the load, the vertical leg having a forwardly facing surface also engagable with the load,

the L-shaped fork including an angular portion arranged at an intersection between the surfaces, the intersecting portion of the fork being undercut to a depth including the right angle intersection of the surfaces so that a rectangularly shaped load may be engaged and supported in simultaneous abutting relation with both of the surfaces,

the fork also including a forwardly projecting tip, the forwardly projecting tip having a spherical configuration to facilitate engagement of the fork with the load.

3,982,648

LIFT ARM SAFETY BAR

Ronald E. Luedtke, Elmhurst, and Clarence A. Ardelt, Wheaton, both of Ill., assignors to International Harvester Company, Chicago, Ill.

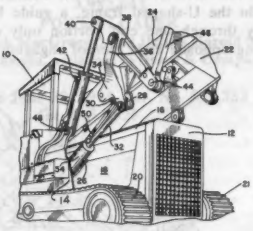
Filed Nov. 10, 1975, Ser. No. 630,106
Int. Cl.² E02F 3/80
U.S. Cl. 214—776 8 Claims

1. In a generally longitudinally disposed linkage in a loader, the combination including:

a generally upright loader carrier frame;

boom structure and lift rod-and-cylinder structure projecting at the end forwardly from the frame;

said boom and cylinder structures at the projecting end being secured together by a pivotal connection therebetween at a point on the boom structure offset downwardly by an arm crook thereon and at a point on the end of the rod, and at the rear end being swingably connected to said frame in an upper portion and in a lower portion, respectively, to swing up and down substantially parallel to one another in a longitudinal vertical plane, the cylinder to said cylinder structure and the extended portion of the rod relative thereto forming an engageable notch at their external juncture; and



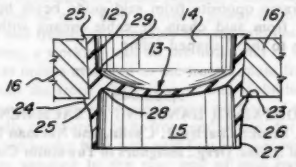
a rigid, elongated prop between the boom and cylinder structures to hold the rod in an extended position relative to its cylinder, said prop at a free end thereof projecting rearwardly, and at a restrained end being swingably connected to the boom structure to swing from an inoperative upper position, to an operatve lower position with the restrained end retained by the swing connection projecting toward seated registry in the crook of the arm and the free end projecting toward seated registry in said notch.

3,982,649

BUNG FOR A BARREL

Herbert J. Wanderer, Wheatridge, Colo., assignor to Denver Plastics, Inc., Denver, Colo.

Filed Jan. 30, 1975, Ser. No. 545,498
Int. Cl.² B65D 39/04
U.S. Cl. 217—108 23 Claims



1. A bung for a container having a wall with a bung orifice comprising:

a resiliently yieldable outer shell with an inner cavity, an inner end and an outer end, said outer shell having a main body section substantially conforming in length to the thickness of the container wall defining said bung orifice and having an external wall surface adapted for sealing engagement with the wall of the container defining said bung orifice, said external wall surface of said main body section being greater in size than the internal dimension of the bung orifice for the radially inwardly directed compression of said main body section upon the forcible insertion of said outer shell into a bung orifice; and

a resiliently yieldable closure head within the outer shell having an outer annular marginal edge attached at the inside of the outer shell, the center point of said attachment along said outer shell being spaced from and between the inner and outer ends of said main body section, said closure head extending generally transverse to said outer shell and arranged along a continuous line from the attachment to the outer shell and meeting at the center of said closure head, said closure head being yieldable to an

inwardly bowed position under compression in response to the radially inwardly directed compression on said main body section with the resiliency of said closure head under compression applying radially outwardly directed forces via the closure head that are substantially uniformly applied to the circumference of the outer shell tending to increase the sealing effect of the bung in the bung orifice.

3,982,650

COLLAPSIBLE CONTAINER

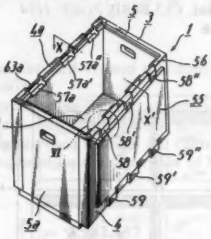
Shigeo Ichihara, Matsudo, Japan, assignor to Dainippon Plastics Co., Ltd., Osaka, Japan

Filed Oct. 14, 1975, Ser. No. 622,329

Claims priority, application Japan, Dec. 20, 1974, 49-147145; Oct. 19, 1974, 49-126370[U]; Oct. 22, 1974, 49-128182[U]; Dec. 20, 1974, 49-155333[U]; Dec. 20, 1974, 49-155334[U]

Int. Cl.² B65D 7/00, 9/12

U.S. Cl. 220—4 F **9 Claims**



1. A collapsible container comprising a substantially rectangular bottom plate and side plates surrounding the bottom plate, at least one of the side plates being formed in its inner surface with a plurality of recessed portions aligned along one end thereof and each having a vertical pin supported by opposed walls defining the recessed portion, another one of the side plates being adjacent to the side plate and provided with a plurality of hinge projections positions in corresponding relation to an engaged in the recessed portions respectively, each of the hinge projections including grooved bearing portions open substantially toward a direction A in which the grooved bearing portions are open when said plates are assembled to comprise said container in its uncollapsed state and an elastic piece for rotatably retaining the vertical pin, each of the hinge projections releasably abutting against an outer wall defining each of the recessed portions.

3,982,651

CONTAINER AND CLOSURE CAP THEREFOR

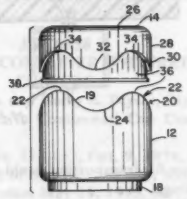
Morris Braun; John M. Gerty, Jr., both of Chicago, Ill., and George B. Spransy, Oconomowoc, Wis., assignors to W. Braun Company, Chicago, Ill.

Filed Nov. 18, 1974, Ser. No. 524,650

Int. Cl.² B65D 11/02, 43/10

U.S. Cl. 220—4 B **3 Claims**

1. A container and closure cap therefor, said container having an open top, a continuous sinuous surface adjacent said open top, said sinuous surface including alternately equally spaced rounded projections merging into adjacent alternately equally spaced rounded recesses, with all parts of said sinuous surface normal to the longitudinal axis of said container, a closure cap for said container, said container having a depth greater than the depth of said closure cap, said closure cap having a skirt and an open bottom, a continuous sinuous surface on said skirt, said continuous sinuous surface on said skirt including alternately equally spaced rounded projections merging into alternately equally spaced adjacent rounded recesses, said last mentioned sinuous surface shaped complementary to said container sinuous surface, with all parts of said last mentioned sinuous surface normal to the longitudinal axis of said closure cap, said closure cap sinuous surface adapted to engage said container sinuous surface with the rounded projections of one positioned in the rounded recesses of the other when the closure cap is in closing position, said closure cap having a short annular wall portion offset inwardly of its respective sinuous surface, with said short annular offset wall portion having an annular bead at the bottom edge thereof and said container having an annular groove to be engaged by said bead when said closure cap is secured to said container, said short annular offset wall portion of said closure cap having an annular free edge which is in close proximity to its respective sinuous surface, said short annular offset wall of said closure cap adapted to interfit within the said container adjacent its sinuous surface to secure said closure cap to said container, said sinuous surfaces of said closure cap and container when in abutting engagement presenting a uniform exterior surface for said closure cap and container at said abutting engagement, rotation of said closure cap with respect to said container causing the projections of the sinuous surface of the closure cap to move out of the recesses of the container to dislodge the closure cap from the container.



3,982,652

FASTENING DEVICE IN COLLAPSIBLE CONTAINERS

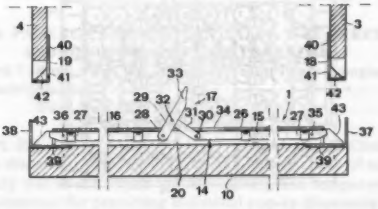
Hans-Elov Nordgren, Pl. 4322, S-828 00 Edsbyn, Sweden

Filed Dec. 21, 1973, Ser. No. 427,143

Claims priority, application Sweden, Jan. 10, 1973, 7300279

Int. Cl.² B65D 7/24

U.S. Cl. 220—7 **19 Claims**



1. A collapsible container comprising a plurality of interconnected walls defining an enclosure, said walls including two spaced opposing walls having at least one end edge facing in generally the same direction, a third wall having a face opposing said two walls end edges, and a locking mechanism releasably connecting said third wall to said two walls, said locking mechanism including a pair of oppositely facing locking members carried by said third wall, openings in said two walls for receiving said locking members and cooperating with said locking members for urging said end edges against said third wall, and a common actuator for said locking members.

3,982,653

PARTITION WALL FOR TANKER CARRYING CRYOGENIC-TEMPERATURE LIQUID

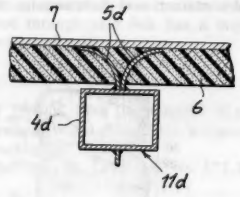
Rudolf Becker, Munich, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed May 12, 1975, Ser. No. 576,310

Claims priority, application Germany, May 14, 1974, 2423287

Int. Cl.² B65D *25/18, 25/00, 85/00*

U.S. Cl. 220—9 LG 13 Claims



1. A container for transporting liquid at cryogenic temperatures, comprising:

wall means including at least one vertical side wall and and a horizontal bottom wall defining a receptacle for said liquid;

a partition upstanding in said receptacle and subdividing same into separate liquid-containing compartments;

means yieldably connecting said partition to said side wall;

means securing said partition to said bottom wall; and

a layer of thermal insulation along said side wall, said partition being formed of cold-resistant metal and being maintained at substantially the same temperature as the cryogenic liquid in said compartment, said partition comprising a series of spaced apart parallel vertical tubes and pairs of back-to-back strips concave outwardly from one another bridging successive tubes and formed nonplanar webs between them.

3,982,654

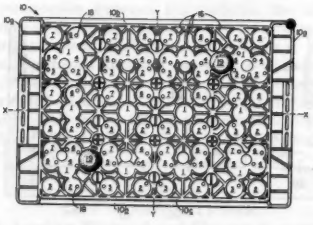
PLASTIC CASE SYSTEM

Robert S. Gottsegen, 10 Harwood Terrace, Leominster, Mass. 01453

Filed Aug. 21, 1974, Ser. No. 499,373

Int. Cl.² B65D *21/02*

U.S. Cl. 220—21 7 Claims



1. A system of cases comprising one layer of identical generally rectangular plastic cases arranged next to each other, each case holding an array of twelve upstanding containers which extend above the case, said containers being arranged in three columns with four containers in each column, another similar layer of cases resting on the crowns of the containers in said one layer, each of said cases including means defining a bottom wall and an array of recesses in the underside of the bottom wall for receiving the crowns of the underlying containers, said other layer being oriented 90° relative to said one layer so that recesses in the cases in said other layer receive the crowns of containers in at least two different cases in said one layer, said array of recesses being symmetric about both the X and Y axes of the bottom wall so that the array is composed of mirror image repeats of the arrangement of recesses in a single quadrant of the bottom wall and wherein the array of recesses is composed of a plurality of different sets of recesses, a first of said sets being symmetric about both the X and Y axes of the bottom wall, a second and third of said sets being symmetric about only one of said axes, and a plurality of sets and said sets being symmetric about neither of said axes.

3,982,655

NESTABLE COMPARTMENTALIZED TRAYS

Günther Kaupert, Thuringer Str. 1, D-5927 Erndtebruck, Westphalia, Germany

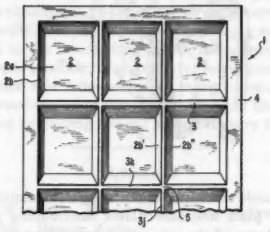
Division of Ser. No. 385,240, Aug. 3, 1973, Pat. No. 3,884,381.

This application Apr. 4, 1975, Ser. No. 565,215

Claims priority, application Germany, Aug. 4, 1972, 2238393

Int. Cl.² B65D *21/02, 1/34*

U.S. Cl. 220—23.6 2 Claims



1. A stack constituted by a plurality of nested compartmentalized trays each having a plurality of cup-shaped depressions; each depression having a base and side walls sloping inwardly towards the base; two side-by-side extending side walls of two adjoining depressions in the same tray being convergent in a direction away from the bases and terminating in a common, straight connecting edge, whereby each tray has a plurality of straight connecting edges; the improvement wherein at least one straight connecting edge in each tray of the stack has a height distance from the base of the associated depressions that is different from the height distance of the remaining straight connecting edges in the same tray; said at least one straight connecting edge in each tray abutting a straight connecting edge of an immediately adjoining nested tray, the abutting straight connecting edges of the two immediately adjoining nested trays being at different heights from the base of their respective depressions, whereby the side walls of mutually nesting depressions are urged to be maintained spaced from one another.

3,982,656

CAN SEALER

Edward C. Kusmierski, 9323 Hasty Ave., Downey, Calif. 90241; John R. Lopez, 345 N. 6th St., Montebello, Calif. 90640, and Phillip Silverman, 8535 W. Knoll St. No. 210, West Hollywood, Calif. 90069

Filed Oct. 10, 1975, Ser. No. 621,493

Int. Cl.² B65D *53/00, 45/00*

U.S. Cl. 220—238 6 Claims

1. A can sealer for resealing an oval opening in a flat can cover, said sealer comprising:

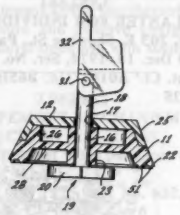
a resilient member of a size to cover said opening;

said resilient member having a central aperture;

first means extending through said aperture and said opening in said can cover, and adopted to engage said cover;

second means in cooperation with said first means to cause said first means to bear against said cover to compress said resilient member between said cover and said second means;

said resilient member being in the shape of a cup having a base and a skirt attached to the periphery thereof;



a resilient boss disposed around said central aperture and within said skirt;

said first means including a T-shaped member having a stem and a head attached perpendicular thereto; and

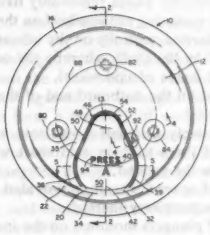
said stem being disposed through the central aperture with said head disposed on the same side of said base as said skirt.

3,982,657

ONE PIECE CONTAINER END MEMBER WITH AN INTEGRAL HINGED OPENING TAB PORTION

Jerome Edmund Keller, Lakewood; Ronald Lynn Moore, and Harold Cook, Jr., both of Golden, all of Colo., assignors to Coors Container Company, Golden, Colo.

Filed July 28, 1975, Ser. No. 599,812
Int. Cl.² B65D *41/32*
U.S. Cl. 220—268 **31 Claims**



1. A container end member, for sealed association with a container body member to provide a sealed container, comprising:

a generally annular one piece sheet of material having a central axis;

an outer annular rim portion for sealed association with the container body member;

a central end wall portion integrally connected to said rim portion and extending generally transversely relative to said central axis; and

a severable and displaceable tab portion in and integrally connected to said central end wall portion having:

an integral hinge portion having circumferentially spaced opposite ends and being located adjacent said outer annular rim portion and extending in generally circumferentially parallel closely spaced relationship relative thereto; and

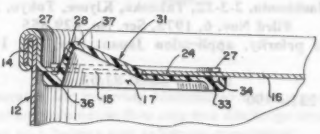
severable score groove means defining a severable wall portion for (separating) severing said tab portion from said central wall portion by axially inwardly directed forces, said score groove means and said severable wall portion extending from said opposite ends of said hinge portion generally radially inwardly relative to said outer annular rim portion toward said central axis and being located in part closely adjacent said central axis and defining a radially elongated and circumferentially extending tab portion area axially inwardly displaceable relative to said central end wall portion by pivotal movement about said hinge portion to provide an opening for the container having a vent portion adjacent said central axis and a pouring portion adjacent said rim portion.

3,982,658

EASY OPENING CONTAINER WITH RETAINED CLOSURE

John S. Bozek, Chicago, and Harry A. Peyser, Olympia Fields, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Continuation of Ser. No. 513,433, Oct. 9, 1974, abandoned, which is a continuation of Ser. No. 365,003, May 29, 1973, abandoned. This application May 19, 1975, Ser. No. 578,447
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976
Int. Cl.² B65D *43/14, 51/04*
U.S. Cl. 220—337 **11 Claims**



1. An easy opening end closure for a container comprising a metal panel, an opening formed in said panel, a closure made from plastic material underlying said opening and having a closure flap, an attachment band hingedly attached to said flap and permanently bonded to the underside of said panel, marginal edge portions about said flap releasably bonded to the underside of said opening, and a tongue integral with said panel extending into said opening from the edge along which said attachment panel is permanently bonded, said tongue being permanently secured to said flap.

3,982,659

BULK PACKAGE FOR SUBSTANTIALLY WET SHEETS AND DISPENSING DEVICE THEREFOR

Richard T. Ross, Aston, Pa., assignor to Scott Paper Company, Philadelphia, Pa.

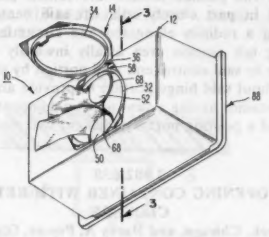
Filed Dec. 24, 1975, Ser. No. 644,022
Int. Cl.² B65H *1/00*
U.S. Cl. 221—63 **13 Claims**

1. A dispensing device employed in a bulk package of substantially wet sheets which are successively and temporarily interconnected for permitting individual pop-up dispensing of the wet sheets, said dispensing device including:

A. a substantially flat section having an opening therethrough which is adapted to communicate with the sheets, and through which successive sheets are adapted to be individually dispensed, said opening including curved surfaces which are substantially free of sharp angles and bends providing spaced lobes; and

B. hingedly connected flexible flaps normally disposed within said lobes in substantially the same plane as the flat section, said flaps having substantially curved outer margins which are substantially free of sharp angles and bends, the outer margins of said flaps being closely positioned to curved surfaces providing the lobes to form

restricting channel means into which successive sheets are directed during sheet dispensing, successive sheets encountering frictional resistance by surfaces of restricting channel means during dispensing of immediately preceding sheets to separate a successive sheet from its



immediately preceding sheet after said immediately preceding sheet has been withdrawn from the package with a portion of the successive sheet extending through the opening to thereby provide for the easy dispensing of the successive sheet.

3,982,660

TOOTH PICK HOLDER

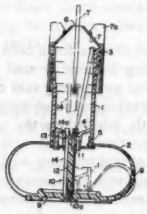
Kimio Hashimoto, 2-3-22, Takeoka, Kiyose, Tokyo, Japan

Filed Nov. 6, 1975, Ser. No. 629,655

Claims priority, application Japan, Nov. 18, 1974, 49-138640

Int. Cl.² B65D *83/02*

U.S. Cl. 221—190 **6 Claims**



1. A toothpick holder comprising:

a substantially cylindrical container capable of containing a multiplicity of toothpicks therein, said container having a funnel-shaped bottom formed as an integral element of the lower part thereof and also having an annular skirt extending downward from the lower peripheral wall thereof;

a cover member removably mounted on the upper part of said container, said cover member having a frusto-conical guide wall terminating in a toothpick dispensing opening in the upper part thereof for guiding one toothpick after another toward said dispensing opening during dispensing;

a toothpick ejecting unit fixed upright to the center of a support base, said toothpick ejecting unit including a rod having at the upper end thereof a recess for receiving and supporting one end of the toothpick to be dispensed, and a plurality of guide vanes fixed vertically to the outer peripheral surface of said rod in equally angular relationship and freely slidably received in associated guideways formed in said bottom of said container, each said guide vane protruding beyond the upper end of said rod and being formed on the inner wall surface thereof with a tapered rib which extends from a point adjacent to the top of said guide vane to the peripheral edge of said supporting recess formed at the upper end of said rod; and

resilient means for restoring said container and said cover member to the original non-operative position after dispensing of the toothpick by forcing said container and said cover member downward along said ejecting unit to the toothpick dispensing position.

3,982,661

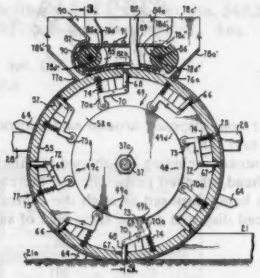
SEED PLANTER FOR INDIVIDUAL SEEDS

Floyd L. Feltrop, 203 E. Shawnee St., Paola, Kans. 66061

Filed Dec. 18, 1974, Ser. No. 533,991

Int. Cl.² A01C *7/18*; B65H *5/00*

U.S. Cl. 221—235 **3 Claims**



1. Means for mechanically planting seeds, comprising, in combination:

a frame adapted for connection to a trailer hitch,

a non-rotating shaft fixedly mounted on said frame and extending at substantial right angles to the direction of forward movement thereof,

a wheel rotatably mounted on one end of said shaft,

said wheel hollow-centered and made up of a cylindrical rim member and inboard (with respect to the frame) and outboard circular plates removably fixed to said rim,

the rotatable mounting of the wheel on the shaft comprising a bearing carried centrally on the inboard plate, the latter penetrated by the shaft, whereby the outboard shaft end is received inside of said wheel,

a cam carried on the outboard end of the shaft within said wheel,

means operatively associated with said wheel for ensuring rotation of the wheel on said shaft when the frame is pulled over the ground,

a plurality of spaced openings provided through said rim around the periphery thereof,

a plurality of plungers mounted on the inside of said wheel, one received in each said opening and adapted to reciprocate therewithin,

means positioned within said wheel and cooperating with said cam for controlling the reciprocation of the several plungers with respect to one another, whereby each plunger is retracted radially inwardly except at the downward position and shortly following same, when each plunger is moved radially outwardly,

forward (in the forward direction of motion of the frame) and rearward shield means each closely enclosing the wheel rim from closely adjacent the top center portion thereof to closely adjacent the bottom portion thereof, whereby to leave an upper center and a lower center portion of the wheel periphery free,

a source of seeds to be planted by said wheel comprising a seed-carrying hopper mounted above the open upper center portion of the wheel, and

means positioned within the lower portion of said hopper which operate to continuously produce a continuous,

aligned stream of seeds which is continuously fed, as said aligned stream, onto the peripheral surface of the rim of said wheel in line with the openings therein,

said last mentioned means continuously moving said aligned stream of seeds in the direction of rotation of the planting wheel as the seeds come into contact with the periphery of the rim thereof,

said last mentioned means maintaining said aligned stream in moving contact with the moving rim peripheral surface substantially across the distance between the forward and rearward shield means at the top thereof,

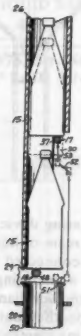
thereby ensuring sure and positive charging of the said wheel rim peripheral openings with seeds.

3,982,662

ARTICLE ESCAPEMENT MECHANISM FOR CASE PACKING MACHINES

Robert H. Graham, Spokane, Wash., assignor to R. A. Pearson Company, Spokane, Wash.

Filed Nov. 17, 1975, Ser. No. 632,501
Int. Cl.² G07F *11/16*
U.S. Cl. 221—296 **8 Claims**



1. An escapement mechanism for handling articles in successive groups wherein the articles each include a reduces upper end and an enlarged lower end and are initially stacked vertically one against the other with the reduced upper end of one article engaged against the enlarged lower end of an adjacent article to form a plurality of upright columns, the effective heights of said articles being equal, and said columns being arranged parallel to each other and in a rectangular array to form rectangular groups of articles within a hopper with the article groups being urged downward toward a hopper discharge end; said escapement mechanism comprising:

a supportive framework;

stop means adjacent the hopper discharge for alternatively engaging and supporting a group of articles at a first elevation and releasing the articles at a downwardly spaced second elevation;

wherein the stop means includes (a) a laterally movable framework movably mounted to the supportive framework, (b) a number of stop bars equal to the number of article files mounted to the movable framework and extending along the length of the files, and (c) means for laterally moving the stop bars between positions intersecting the article columns and positions laterally clear of the article columns;

lift means for vertically moving the stop means between the first and second elevations; and

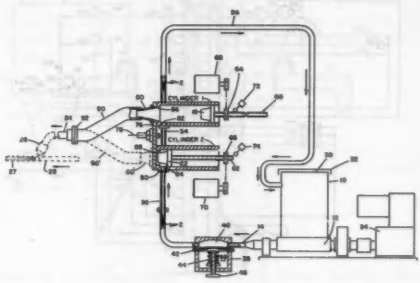
retractable support means for intersecting the columns of articles at one of the elevations to provide support therefore while the stop means is moved clear of the article columns and for moving clear of the columns to release a group of articles at the one elevation as the stop means is moved to intersect the columns and provide support therefore.

3,982,663

METHOD AND APPARATUS FOR METERING THIXOTROPIC BATTERY PASTE

Terrance M. Larkin, Littleton, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Feb. 7, 1975, Ser. No. 547,833
Int. Cl.² G01F *11/44*
U.S. Cl. 222—1 **13 Claims**



1. Apparatus for metering thixotropic battery paste at a predetermined volumetric flow rate to a discharge conduit for application to a battery grid substrate comprising:

a reservoir for reception of make-up thixotropic paste;

pump means in fluid flow connection with the reservoir for pumping the paste through a forward conduit;

metering means having an inlet and an outlet and whose outlet is adaptable to be connectible to a discharge conduit and whose inlet is connected to said forward conduit, the metering means comprising:

a first elongated chamber having forward and rearward portions and port means connectible to the inlett for reception of paste, and having a ram mechanically movable within the rearward portion of the chamber for displacing paste at said predetermined volumetric flow rate through said forward portion toward said discharge conduit;

a second elongated chamber having forward and rearward portions and port means connectible to the inlet for reception of paste, and having a ram mechanically movable within the rearward portion of the chamber for displacing paste at said predetermined volumetric flow rate through said forward portion toward said discharge conduit;

means for reciprocally and synchronously moving the rams within the chambers adapted and arranged so that while one of the rams within its associated chamber is displacing paste toward the discharge conduit the other ram is either reversing to enable filling of its associated chamber with paste or is stationary;

valve means for alternately connecting the port means of the first and second chambers to the inlet of the metering means;

means for alternately connecting the forward portions of the first and second chambers to the metering means outlet; and

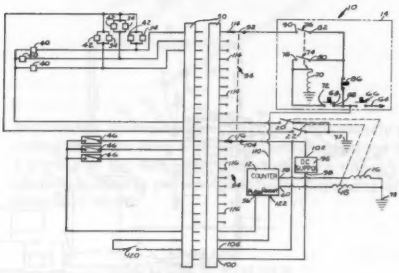
return conduit means, in fluid communication with said metering means inlet, connected to said reservoir for circulating paste back through said pump means to form a closed loop paste circulation system.

3,982,664

BATCH CONTROLLER FOR GASOLINE HAVING DRIBBLE FEED

Elmer A. Robbins, and William D. Key, both of Fort Wayne, Ind., assignors to Tokheim Corporation, Fort Wayne, Ind.

Filed Sept. 4, 1975, Ser. No. 610,103
Int. Cl.² G07F 13/02
U.S. Cl. 222—21 5 Claims



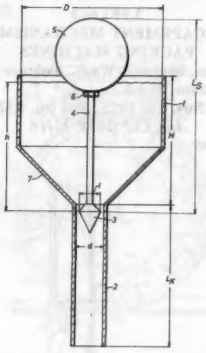
1. In a batch controller for controlling a plurality of material dispensers, the combination comprising starting circuit means connected to a source of operating potential and including a switch for generating an operating signal in response to operation of said switch, reset circuit means including a reset switch for generating a reset signal in response to operation of said reset switch, presettable counter means for generating a fast-flow control signal and a slow-flow control signal in response to said operating signal, said presettable counter means including a pulse input circuit for receiving electrical pulse signals, means for terminating said fast-flow signal in response to a first selected number of said pulse signals and means for terminating said slow-flow signal in response to a second selected number of said pulse signals, a plurality of flow generating means operable between on and off states in response to said operating signal and said slow-flow signal for generating a flow of material, a pulse generating means coupled to the output of each of said flow generating means for generating an electrical pulse signal in response to each incremental quantity of flow therefrom, a plurality of fast-flow control valve means each being operable between open and closed conditions in response to said operating signal and said fast-flow control signal and to the absence thereof, respectively, for controlling the flow of said material at a first flow rate, a plurality of slow-flow control valve means each being operable between open and closed conditions in response to said operating signal and said slow-flow control signal and to the absence thereof, respectively, for controlling the flow of said material at a second flow rate, said second flow rate being substantially smaller than said first flow rate, there being one said fast-flow control valve means, one of said slow-flow control valve means and one of said incremental pulse generating means associated with each said flow generating means, respectively, and multiple position switch means for individually coupling associated ones of said flow generating means, fast-flow control valve means, slow-flow control valve means, and electrical pulse generating means to said presettable counter means.

3,982,665

OUT-FLOW METERING DEVICE

Hans Frenken; Georg Schindler, both of Leverkusen, and Josef Friedsam, Langenfeld, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Nov. 6, 1974, Ser. No. 521,480
Claims priority, application Germany, Nov. 9, 1973, 2356010
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976
Int. Cl.² B67D 5/08
U.S. Cl. 222—67 11 Claims



1. An outflow-metering device for a storage vessel for dispensing a constant stream of liquid per unit of time, comprising an outflow tube connected to the bottom of the storage vessel, a float and a metering element rigidly connected thereto which has a smaller diameter than the internal diameter of the outflow tube, the float being disposed in the storage vessel with the metering element disposed in the outflow tube, whereby the vertical position of the metering element in the outflow tube changes with the liquid level in the storage vessel and remains at a constant distance from the float to provide a substantially constant volume of flow of liquid from the outflow tube while sufficient liquid remains in the storage vessel to support the float.

3,982,666

FINE TIMING APPARATUS FOR ELECTRONIC DETERGENT DISPENSING SYSTEM

David L. Kleimola; Marcus I. Nystuen, both of St. Paul, and David L. Nystuen, Bloomington, all of Minn., assignors to Economics Laboratory, Inc., St. Paul, Minn.

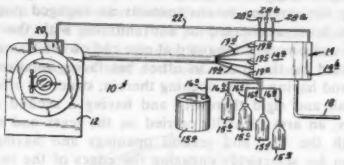
Division of Ser. No. 335,136, Feb. 23, 1973, Pat. No. 3,881,328, which is a division of Ser. No. 210,669, Dec. 22, 1971, abandoned. This application Mar. 24, 1975, Ser. No. 561,373
Int. Cl.² D06F 39/02
U.S. Cl. 222—70 4 Claims

1. In laundry apparatus, a fine timer adapted to be intercalated between a primary coarse timer, which gives an electrical control signal, and a laundry additive injection means energized thereby, to render the injection interval terminable independently of the continuation of the control signal, comprising, in combination:

switching means normally conducting the control signal from said coarse timer to said injection means to initiate operation thereof;

electronic timing means connected to receive said control signal for giving a second signal at a predetermined interval after the reception of said control signal, said second signal thereafter continuing as long as said control signal;

and means connecting said electronic timing means to said switching means to cause and continue interruption of the supply of said control signal to said additive injection means,



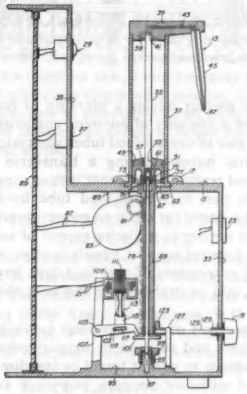
so that injection of additive is initiated by the initiation of said control signals, and is terminated by the initiation of said second signal even though said control signal is continuing.

3,982,667

DILUTING LIQUID SAMPLES

Bu Shing Chen, Miami, Fla., assignor to Hyperion Incorporated, Miami, Fla.

Filed Nov. 24, 1975, Ser. No. 634,457
Int. Cl.² B67D *5/14*
U.S. Cl. 222—70 **20 Claims**



1. Apparatus for diluting a sample of liquid with a diluent comprising

a diluent cylinder having an outlet at one end thereof,

a conduit communicating with said cylinder outlet,

a diluent dispensing piston within said cylinder of substantially the same cross section as said cylinder and having a bore therethrough, and a second piston of relatively smaller cross section than said diluent dispensing piston supported in said bore for movement with respect to said diluent dispensing piston,

piston drive means comprising first means for moving said diluent dispensing piston toward said cylinder outlet substantially the full length of said cylinder to dispense a large fraction of diluent contained in said cylinder, and second means for moving said second piston relative to said diluent dispensing piston in a direction away from said cylinder outlet for a distance must less than the full length of said cylinder;

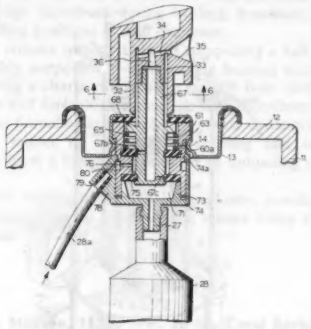
whereby movement of said second, smaller piston enables aspiration of relatively small sample of liquid into said conduit and subsequent movement of said diluent dispensing piston toward said outlet enables ejection from said conduit of said relatively small sample along with a relatively large quantity of diluent.

3,982,668

AEROSOL DISPENSER FOR PLURALITY OF FLUENT MATERIALS

Pasquale R. Riccio, Salem, N.H., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 4, 1974, Ser. No. 512,321
Int. Cl.² B65D *83/14*
U.S. Cl. 222—95 **4 Claims**



1. An aerosol type dispenser comprising: a plurality of sources of fluent material to be dispensed and a source of propellant gas under pressure and exerting pressure on the fluent materials of said sources of fluent material, valve means on said dispenser comprising a support, a stem movably mounted on said support, said support having a hollow interior into which said stem is movable, said stem having pressurized fluent material passage means therein and having a first lateral opening opening into said passage means and a second lateral opening opening into said passage means, gasket means in said support through which said stem is slidable in sealing engagement for closing and opening said lateral openings, one of said sources of fluent material opening into the space around the lower end of said stem to which said first lateral opening is exposed, the other of said sources opening into the hollow interior of said support to which said second lateral opening is exposed, a further gasket on said support and a flange on said stem in said hollow interior of said support engaging said further gasket when the stem is in a raised condition, said support having a bore therein communicating with said source of propellant gas and opening into said hollow interior, and a dispensing nozzle means on the end of said stem outside said support, said stem having propellant passage defining means along the outer surface thereof from said support to said dispensing nozzle means, the bore in the support, the hollow interior and the propellant passage defining means constituting a pressurized gas flow path to said nozzle means.

3,982,669

HOT MELT DISPENSING APPARATUS AND METHOD

Leo M. Moore, Ashland, Va., assignor to Industrial Machine Service Company, Richmond, Va.

Filed Nov. 20, 1975, Ser. No. 633,649
Int. Cl.² B67D *5/62;* **G01F** *11/00*
U.S. Cl. 222—146 HE **35 Claims**

1. A system for dispensing material from a container comprising:

a plate having a top surface and a bottom surface and having an aperture therethrough, said plate being shaped to fit inside a container which contains a material that is to be dispensed;

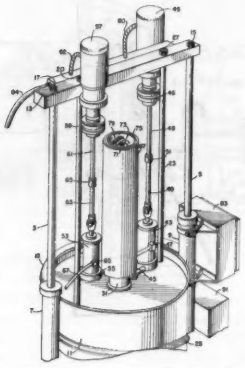
resilient wiper means surrounding said plate, said wiper means being adapted to slidably engage the inside surface of said container;

a coupler having at least a first chamber and a second chamber, said coupler being secured to said top surface of said plate such that said first chamber communicates with said aperture in said plate;

a pump having an inlet secured to said coupler in such a manner that said inlet communicates with said first chamber of said coupler and having an outlet secured to said coupler such that said outlet communicates with said second chamber of said coupler;

a hollow standpipe having a first end secured to said coupler in such a manner that said hollow stand-pipe communicates with said second chamber of said coupler; and

a de-aerator cap detachably coupled to said second end of said hollow standpipe, whereby said pump when operating pumps said material out of said container through said aperture in said plate, through said hollow standpipe and through said de-aerator cap to thereby remove any entrapped air from said material.



3,982,670

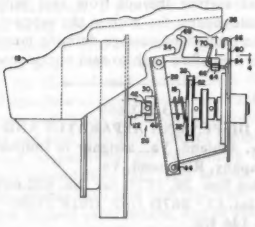
DISENGAGEABLE PLANTER SEED METER DRIVE

Ronald William Brass, Bettendorf, Iowa, assignor to Deere & Company, Moline, Ill.

Filed July 10, 1975, Ser. No. 594,775

Int. Cl.[2] A01C *7/18, 7/20*

U.S. Cl. 222—177 **8 Claims**



1. On a planter assembly, a mobile frame having groundengaging drive wheels; a power shaft; a drive train extending between the wheels and power shaft for driving the latter; a seed hopper supported on the frame; a seed selecting and dispensing means, including a seed delivery means for transferring said seed from the selected means to a furrow, and including a seed meter drive shaft therefore axially aligned with the power shaft, the improvement comprising: a sliding coupler means between the power shaft and seed meter drive shaft for engagably coupling said shafts; biasing means for biasing the coupler means towards an engaged position; a control lever connected to and shiftable with the coupler means and pivotally mounted at one end on the frame; a wall supported on the frame in offset but facing relation to the lever and having a first opening therein; structure offset from the wall and rigid therewith and having a second opening therein; an arm pivotally carried on the lever and shiftable through the first and second openings and having a lug thereon for selectively engaging the edges of the respective openings for locking said coupler means in its disengaged or engaged positions respectively.

3,982,671

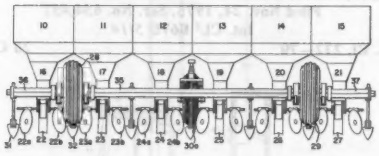
MULTIPLE FEED POTATO PLANTER

Robert B. Curl, 1960 Floral Ave., P.O. Box 562, Twin Falls, Idaho 83301

Filed Aug. 28, 1975, Ser. No. 608,559

Int. Cl.[2] A01C *15/00*

U.S. Cl. 222—178 **7 Claims**



1. A potato planter having a plurality of feed tubes each associated with a plurality of hoppers, comprising:

a. at least a pair of central feed tubes associated with at least one central hopper having a transverse bar attached thereto and tractor attachment means supported by said transverse bar, each said feed tube having associated therewith a conveyor chain to convey potato seed from a main feed hopper to a discharge end of said feed tube;

b. a pair of forward support wheels in close alignment with the lower extremities of said feed tube immediately outboard of said central hopper and near the front of said hopper;

c. at least one pair of trailing wheels located to the rear of said hoppers and secured to support means above said trailing wheels to permit travel in any direction;

d. a pair of outboard hoppers, one each attached to the outermost hoppers of the central hoppers and outboard of said forward support wheels, and

e. attachment means adapted to attach to the hydraulic lift mechanism of a tractor to lift said forward support wheels off the ground.

3,982,672

APPLICATORS OF GRANULAR MATERIALS

Horstine Farmery, North Newbald, York, England

Filed June 11, 1975, Ser. No. 585,746

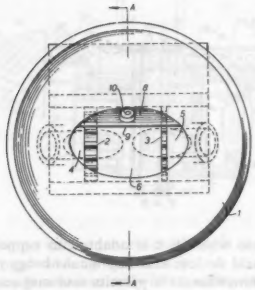
Claims priority, application United Kingdom, June 14, 1974, 26431/74

Int. Cl.[2] G01F *11/00*

U.S. Cl. 222—274 **6 Claims**

1. In a machine, for delivery of metered quantities of granular material, comprising a hopper, a discharge outlet, and a metering device in the lower regions of the hopper for conveying measured quantities of granular material between said hopper and said discharge outlet, said metering device comprising a cylindrical rotary member with peripheral flutes defining peripheral recesses in said member which recesses are, when the member is rotated, successively charged with

granular contents from said hopper, peripherally closed by an internal surface of said hopper, and open at the discharge outlet to permit discharge of the conveyed material, the improvement comprising: non rotatable cylindrical members at the ends of said rotary member and closing the ends of said recesses, a wear member in the form of a cylindrically arcuate plate overlying a portion of the periphery of said rotary member at one side of and extending to said hopper and overlying adjacent portions of said non rotatable members, and means releasably securing said wear member to at least one of said non rotatable members.



3. A machine as claimed in claim 1 in which the metering device comprises a plurality of rotary bodies, each having granular material conveying recesses therein, arranged for rotation about a common axis, a non rotatable member therebetween, and wherein a single wear member extends parallel to said common axis to effectively close each recess in each rotary member before that recess is closed by the associated internal hopper surface.

3,982,673

DISPENSER FOR EXPLOSIVES HAVING ADJUSTABLE TRAP CHAMBER

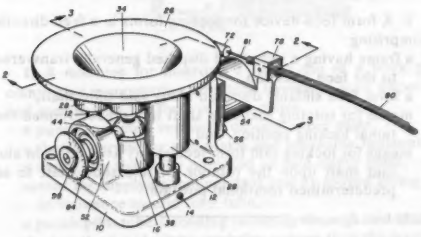
William R. Van Brussel, Mount Pleasant; Joseph C. Lestage, and Wayne J. Hartman, both of Burlington, all of Iowa, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 19, 1975, Ser. No. 559,954

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.[2] G01F *11/00, 11/10*

U.S. Cl. 222—306 **3 Claims**



1. A ball dispenser for initiating explosives which comprises:

a base casting having integral bearing housing sections positioned thereon;

a pair of vertically positioned guide rods fixedly attached to said base casting;

hopper means slidably supported on said guide rods for holding a reserve supply of an explosive powder therein which includes;

a circularly shaped flanged hopper casting having guide bosses vertically positioned thereon, said bosses having bushing bores axially positioned therein and a hyperbolically shaped feeder section having an axially positioned insert counterbore therein;

ball bushings fixedly held in said bushing bores for slidably moving on said guide rods; and

a seal insert fixedly positioned in said insert counterbore, said insert having a spherically shaped end which contacts said transport means and prevents powder leakage therefrom during loading, transport and unloading positions of said dispenser;

variable volume transport means comprising a ball housing rotatably supported in said bearing housing sections for receiving a charge of explosive powder from said hopper means and for unloading said powder therefrom;

means for funneling said powder from said transport means;

actuator means for sequentially rotating said transport means from a loading position to an unloading position; and

means for voiding said initiating explosive powders from said hopper means, said voiding means being remotely actuated.

3,982,674

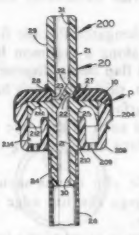
VALVE

William D. Mildern, 11799 NW. 26 St., Coral Springs, Fla. 33065

Continuation-in-part of Ser. No. 420,229, Nov. 29, 1973, Pat. No. 3,841,602. This application Sept. 9, 1974, Ser. No. 504,200

Int. Cl.[2] B65D *83/14*

U.S. Cl. 222—402.21 **10 Claims**



1. In a valve for use with a pressurized aerosol dispensing container containing pressurized product which valve comprises:

hollow annular mounting means for sealed attachment to the mouth of the container and having an inside cylindrical surface;

an axially movable, tubular valve body spaced inward from said cylindrical surface, which valve body includes a longitudinal bore therethrough with a wall having vertically offset portions and separating the bore into an eduction passageway below said wall and a discharge passageway above said wall, an inlet orifice below said wall and formed in said valve body in communication with said eduction passageway, an outlet orifice above said wall and formed in said valve body in communication with said discharge passageway, and said orifices having bottoms with the bottom of said outlet orifice below the bottom of said inlet orifice; and

an annular elastomeric sealing gasket encompassing said valve body with its inner margin normally sealingly occluding both of said orifices to close said valve and overlying said annular mounting means, said gasket having an underside;

the separation between the bottoms of said inlet and outlet orifices providing occlusion of the inlet orifice before the outlet orifice by said gasket as the valve moves toward closure;

the improvement wherein:

said valve body has a circular, yieldable piston affixed thereto normally engaging the underside of said gasket and slidably and sealingly engaging the inside cylindrical surface of said annular mounting means so that when said valve body is depressed, said gasket flexes downward to open said orifices and said piston slides down along said inside cylindrical surface of said annular mounting means to form an annular chamber which communicates said inlet orifice with said outlet orifice.

3,982,675

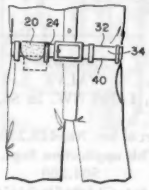
QUICK CHANGE PORTABLE POCKET

Dallas D. Claypool, Zanesville, Ohio, assignor to The Raymond Lee Organization, Inc., a part interest

Filed July 21, 1975, Ser. No. 597,656

Int. Cl.² A45C *1/04*

U.S. Cl. 224—26 R **3 Claims**



1. A portable device detachably securable to a belt, said device comprising:

first and second elongated flexible flaps disposed in spaced apart position along a common line of elongation, one end of the first flap being disposed adjacent one end of the second flap, said flaps each having an outer surface and an inner surface;

a plate secured to each of said one ends on the inner surfaces of both flaps and spanning the space between said adjacent ends;

manually operable clip means secured to said plate and adapted to engage the top edge of said belt when the device is in use;

belt engaing means secured to the inner surface of the first flap and spaced from said plate, said belt means extending in a direction perpendicular to said line of elongation and adapted to engage the bottom edge of said belt when the device is in use; and

pocket forming means secured to the outer surface of the second flap and spaced from said plate, the pocket forming means having an opening disposed adjacent said plate.

3,982,676

DEVICE FOR HANDLING CARTRIDGE MAGAZINES AND SUCHLIKE

Maurice V. Bourlet, Liege, Belgium, assignor to Fabrique Nationale Herstal S.A., Herstal-lez-Liege, Belgium

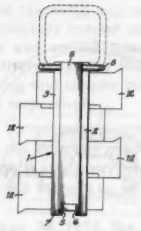
Filed Aug. 13, 1974, Ser. No. 497,073

Claims priority, application Belgium, Sept. 28, 1973, 805427

Int. Cl.² F42B *39/00*

U.S. Cl. 224—45 R **6 Claims**

1. A device for supporting a stack of a plurality of magazines, such as cartridge magazines having a back face and two longitudinal edges, said device comprising: a generally planar back plate having two longitudinal, parallel edges; a U-shaped channel member rigid with and extending along the length of each longitudinal edge of said back plate, the open side of said channels being in opposed relation for receiving the longitudinal edges of said magazine; flap means pivoted to one end of said back plate, said flap means being disposed between said U-shaped channel members and said back plate; spring means continuously urging said flap means to a first closed position providing a wall at said one end of said back plate extending



normal thereto wherein it is adapted to support magazines attached to said device, said flap means being pivotable to a second position wherein it permits said magazines to pass it and be removed from said one end of said device; stop means disposed between said flap means and said back plate limiting downward pivotal movement of said flap means to said first position and a handle hingedly mounted at the other end of said back plate.

3,982,677

DEVICE FOR LOCKING A MOVABLE FORM FEED

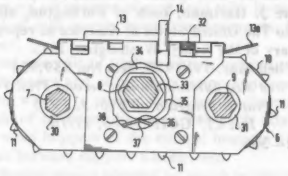
Güenter Holland-Letz, Paderborn-Wewer, Germany, assignor to Nixdorf Computer AG, Paderborn, Germany

Filed Apr. 23, 1975, Ser. No. 570,772

Claims priority, application Germany, Apr. 24, 1974, 2419849

Int. Cl.² G03B *1/30*

U.S. Cl. 226—75 **12 Claims**



1. A form feed device for feeding forms in a feed direction comprising:

a frame having a slide shaft disposed generally transversely to the feed direction,

a form feed slidably disposed along said slide shaft,

means for rotating said slide shaft to a predetermined rotational locking position, and

means for locking said form feed at any axial position along said shaft upon the rotation of said slide shaft to said predetermined rotational position.

3,982,678

NAIL DRIVING APPARATUS

Jerome A. Olson, 135 Gray Ave., Waukee, Iowa 50263

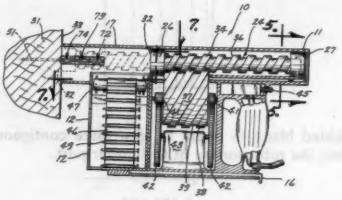
Filed Feb. 14, 1975, Ser. No. 549,905

Int. Cl.² B25C *11/00, 1/06*

U.S. Cl. 227—63 **23 Claims**

1. A device for driving nails comprising:

a housing;
a barrel attached to said housing;
an elongated driven member attached to said housing and positioned for movement along a longitudinal axis thereof at least partially within said barrel and having a nail engaging portion;
a driving means for selectively moving said driven member in a direction along the longitudinal axis thereof, said driven member having a driving stroke in one direction



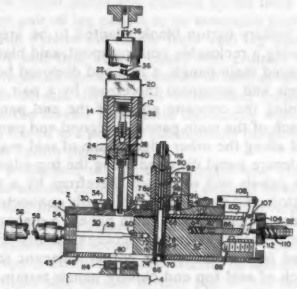
for driving a nail and a return stroke in an opposite direction along said longitudinal axis;
gear means for mechanically interlocking said driven member to said driving means during said driving stroke;
nail holding means attached to said barrel for holding said nail in position to be engaged by the nail engaging portion of said elongated driven member; and
means for controlling the movement of the driving means and thereby controlling the movement of said driven member.

3,982,679

MACHINE FOR DRIVING SPRING PINS

William P. White, Jr., c/o Mechanical Application, Inc., Airport Road, Wiscasset, Maine 04578

Filed Aug. 11, 1975, Ser. No. 603,667
Int. Cl.² B27F 7/02
U.S. Cl. 227—116 **9 Claims**



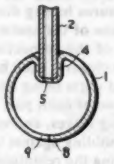
1. A machine for inserting a spring pin in a work piece comprising a supporting structure having at least upper and end members in the form of rigid plates,
a punch mounted vertically on said upper plate,
a shuttle carried by said plates and moveable horizontally,
a spring pin feed tube mounted on said upper plate,
means for supplying independent gravity moved spring pins in sequence to said feed tube,
a punch pilot tube extending vertically through said shuttle,
the length of said pilot tube being greater than the length of said spring pins,
means for moving said shuttle in one direction to place said pilot tube in loading position in alignment with said feed tube,
means permitting one spring pin to fall from said feed tube into said pilot tube when said tubes are aligned while restraining the descent of all spring pins in said feed tube thereabove,
means in said pilot tube for releaseably holding said one spring pin from falling therethrough,
means for moving said shuttle in the opposite direction to a position in which said pilot tube is aligned with said punch,
means operable while said shuttle is moving toward said punch for removing the restraining means on the spring pins in said feed tube so that spring pins in said feed tube will fall a distance of one pin and the leading pin in said feed tube will engage and be stopped by said shuttle,
means for actuating said punch when said punch and pilot tube are aligned to drive said spring pin then in said pilot tube downward into a work piece located therebelow,
means for withdrawing said punch from said pilot tube,
means for again moving said shuttle to the original loading position in which said pilot tube is again in alignment with said feed tube,
and means actuated by and during movement of said shuttle from punch position to loading position for applying said restraining means to the spring pin next above the spring pin then resting on said shuttle prior to said pilot tube and feed tube coming into alignment, whereby when said pilot and feed tubes come into alignment, only a single spring pin will fall into said pilot tube.

3,982,680

SOLDERING METHOD

Kanichi Ishikawa, Aichi, and Kazumi Iijima, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 9, 1975, Ser. No. 539,741
Claims priority, application Japan, Feb. 14, 1974, 49-18315
Int. Cl.² B23K 31/02
U.S. Cl. 228—174 **5 Claims**



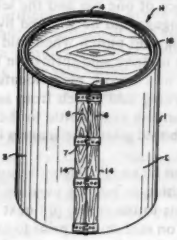
1. A method for soldering a pipe to a member comprising the steps of:
making a pipe from a flat metal sheet with solder coated uniformly over its whole surface,
forming a concave portion on an outer surface of said pipe with an aperture at the bottom thereof,
inserting a member into said concave portion,
heating said pipe and member together to melt said solder to infiltrate into the clearance between an inner surface of said concave portion and outer surface of said member and thereby place the member in sealed communication with the aperture; and
forming a flange portion at two opposite margins of the sheet, so that when the sheet is made into a pipe the two flanges lie face to face at the opposite side of the pipe from said concave portion and become connected by said solder upon said heating of the pipe.

3,982,681

PAPERBOARD HOGSHEAD

Charles Berger Graves, Alton; Paul J. Richnak, Godfrey, both of Ill.; Robert M. Wilkinson, Florissant, Mo., and Robert G. Wright, Statesville, N.C., assignors to Alton Box Board Company, Alton, Ill.

Filed Mar. 10, 1975, Ser. No. 556,791
Int. Cl.[2] B65D *3/00, 25/14, 25/34*
U.S. Cl. 229—4.5 19 Claims



1. A hogshead formed from a wound paper tube and of the type designed for holding a quantity of prized tobacco during its transit and storage, and being collapsible to facilitate its component return for reuse, said paper tube being formed of convolutely wound paper and to a thickness to provide for its strucutral integrity even when encountering the forces of tobacco prizing, the paper tube of each hogshead being cut into complemental half portions, a series of reinforcing staves, each stave having a length approximating the heighth of tube half portions with one of said staves being adhered to each outer marginal cut edge of a tube half portion, means fastening each stave to the contiguous portion, a series of hinge means fastening to the staves and cooperating with pin means for retaining the tube halves together, a pair of retaining liners, one of each liner adhering to the upper and lower marginal edges of each tube half portion, said liners also being cut to correspond the dimensions of each tube half portion, upper and lower end closures having dimensions corresponding to the inner dimensions of the assembled tube halves and being retained inwardly of the respective retaining liners to secure the hogshead into closure, each hinge means including a pair of hinge parts, said parts being held together by means of said pin means with one of each part being secured to one of the adjacent reinforcing staves, and each hinge means part having a turned end for holding against the remote edge of its proximate stave for insuring the retention of the hogshead into closure during tobacco compression.

3,982,682

CORNER POST

Edwin A. Fremion, West Alexandria, Ohio, assignor to Westvaco Corporation, New York, N.Y.

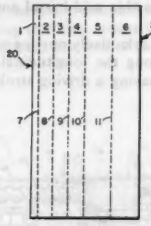
Filed Mar. 4, 1976, Ser. No. 663,996
Int. Cl.[2] B65D *25/16*
U.S. Cl. 229—14 C 12 Claims

1. A corner post construction for use between the vertical corners of containers and products packaged therein consisting essentially of a corner post structure that is normally stored and shipped in a flat condition but when erected assumes a cross-sectional configuration substantially in the form of an integral rectangular tube and attached leg comprising:

a. a substantially rectangular blank of paperboard material or the like, scored along parallel fold lines to form a plurality of discrete panels of unequal width;

b. said blank being folded flat about at least two of said fold lines to bring at least two of said panels into overlapping engagement for the purpose of adhering said two panels together;

c. said flat folded blank being adapted to be erected into useable condition as a corner post by manipulating the



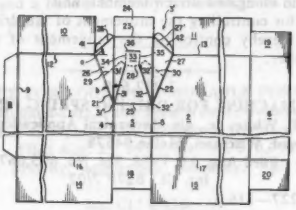
folded blank to orient at least three contiguous panels into the tube portion of the corner post.

3,982,683

CARTON WITH POURING SPOUT

Lloyd H. Forteau, Brooklyn, N.Y., assignor to Standard Folding Cartons, Inc., Jackson Heights, N.Y.

Filed June 4, 1975, Ser. No. 583,759
Int. Cl.[2] B65D *5/72*
U.S. Cl. 229—17 R 13 Claims



3. In a unitary carton blank adapted to be erected into a carton having a reclosable pouring spout, said blank having a pair of spaced main panels, a first end disposed between said main panels and separated therefrom by a pair of first fold lines defining the opposite edges of the end panel and one edge of each of the main panels, a second end panel hingedly connected along the other edge of one of said main panels, a top end closure panel disposed along the top edge of each of said main panels and separated therefrom by a second fold line, a bottom end closure panel hingedly connected along the bottom edge of each of said main panels, a diagonal fold line on each main panel extending between the first fold line and the second fold in the upper corner adjacent the first end panel, each of said top end closure panels terminating at the intersection of the adjacent diagonal fold line with the second fold line, and the first end panel extending higher than the top edges of the main panels and defining an upper section above the intersection of the diagonal fold lines with the first pair of fold lines whereby said blank when erected forms a carton with a diagonally angled upper corner panel recessed between the main panels and under the top closure panels for opening into a pouring spout, the improvement comprising:

a. a central score line formed in the upper section of the end side panel between the opposite edges thereof;

b. a pair of spout forming score lines extending from the opposite ends of the central score line to the diagonal fold lines intermediate their ends;

c. a pair of tab forming score lines, each of which extends from adjacent one end of the central score line and in a direction toward but spaced from the top edge of the upper section of the first end panel; and

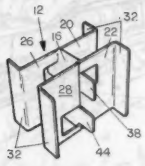
d. a tab forming fold line extending between the uppermost ends of the tab forming score lines.

3,982,684

CARTON DIVIDER PAD

Frank A. David, Collinsville, Ill., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 28, 1975, Ser. No. 572,107
Int. Cl.² B65D 5/48, 3/24
U.S. Cl. 229—28 R 4 Claims



1. A self-positioning, one-piece, H-shaped divider pad insertable into a carton to divide the carton into six equal-sized compartments, said divider pad comprising, in combination:

a first center panel;

a second center panel hingedly attached along one edge thereof to said first center panel and foldable into overlying, face-to-face relationship relative to said first center panel;

a first pair of leg panels hingedly attached to the opposite edges of said first center panel and foldable out of the material of said first center panel to a position substantially perpendicular to said first center panel;

a second pair of leg panels hingedly attached to the opposite edges of said second center panel and foldable out of the material of said second center panel to a position substantially perpendicular to said second center panel and substantially parallel to said first pair of leg panels;

a first projection tab formed integral and coextensive with said first center panel and defined by slit lines in one of said first pair of leg panels to be severable from said leg panel and extend outwardly from said leg panel in the plane of said first center panel into contact with said carton to divide the space exterior of said divider pad on one side of said divider pad within said carton and to position the divider pad within the carton when said leg panel is folded to a position substantially perpendicular to said first center panel; and

a second projection tab formed integral and coextensive with said second center panel and defined by slit lines in one of said first pair of leg panels to be severable from said leg panel and extend outwardly from said leg panel in the plane of said second center panel into contact with said carton to divide the space exterior of said divider pad on the other side of said divider pad within said carton and to position the divider pad within said carton when said leg panel is folded to a position substantially perpendicular to said second center panel.

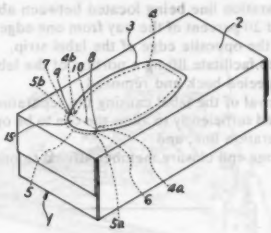
3,982,685

METHOD AND DEVICE FOR SEPARATING CARTON LAYERS TO OPEN A CLOSED TYPE CARTON CONTAINER

Yoshiji Shimada, Kobe, Japan, assignor to Kinki Printing Company Limited, Osaka, Japan

Filed Sept. 2, 1975, Ser. No. 609,330
Int. Cl.² B65D 5/54, 5/72
U.S. Cl. 229—51 TS 5 Claims

1. A dispensing carton having walls defining a hollow enclosure, one of said walls being paperboard and having a first cut line cut from the outside and extending partially through the paperboard, said first cut line extending as a closed loop, a second cut line cut from the inside and extending partially through the paperboard, said second cut line having an open generally loop-like configuration with opposed terminating ends, said second cut line being spaced radially inwardly of a portion of said first cut line, a third cut line cut from the inside and extending partially through the paperboard, said third cut line having an open generally loop-like configuration with



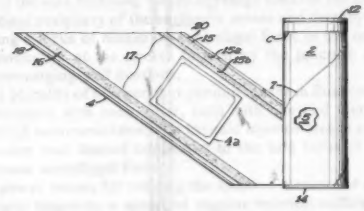
opposed terminating ends, said third cut line being spaced radially outwardly of another portion of said first cut line, a pair of generally linear cut lines cut from the inside and partially extending through the paperboard, each of said pair of generally linear cut lines connecting said terminating ends of said second and third cut lines respectively, and a fold line connecting the points where said first cut line overlaps said linear cut lines.

3,982,686

SPIRAL WOUND CAN WITH PROVISION FOR PRINTING LOWER SIDE OF LABEL

A. Kenneth Parlour, Fridley; James R. Leezer, and Charles H. Turpin, both of Minneapolis, all of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Continuation of Ser. No. 502,328, Sept. 3, 1974, abandoned.
This application Jan. 14, 1976, Ser. No. 648,989
Int. Cl.² B65D 5/54, 17/00
U.S. Cl. 229—51 BP 10 Claims



1. An easily opened fiber can for food products, said can comprising,

a. a helically wound body stock layer formed from an elongated strip of flexible sheet material having its side edges abutted against one another to form a helically extending butt joint defining a separation line adapted to part when the can is opened,

b. a moisture resistant helically wound inner liner aginst the inside surface of the body stock layer, the liner being bonded to the inner surface of the body stock layer,

c. a label strip wound helically over the body stock layer and being bonded thereto by two relatively narrow adhesive strips, one strip extending along substantially each side edge of the label strip,

d. a relatively wide adhesive free area extending helically on the inner surface of the label strip between the relatively

narrower adhesive strips and the adhesive strips and the adhesive free area being of a width of over half of the label strip width,

e. printed indicia applied to the adhesive free area on the inner surface of the label,

f. one of said two adhesive strips on the edge of the label being bonded over the separation line and having a width less than about one forth the width of the label but sufficiently wide to hold the separation line together prior to removal of the label,

g. the separation line being located between about 10 percent and 20 percent of the way from one edge of the label strip to the opposite edge of the label strip,

h. means to facilitate lifting a portion of the label so that it can be peeled back and removed,

i. the removal of the label causing the separation line to be weakened sufficiently to allow the can to be opened along the separation line, and

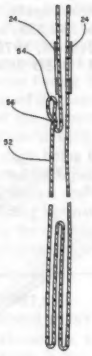
j. at least one end closure member affixed to one end of the can.

3,982,687

CLOSE AND CARRY BAG

Mary L. Auer, Neenah, and Richard L. Roeder, Appleton, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed July 9, 1975, Ser. No. 594,451
Int. Cl.² B65D *33/24, 33/28*
U.S. Cl. 229—62 **7 Claims**



1. A reclosable bag comprising a bottom end, sidewalls, and a top end, formed from heat-sealable material,

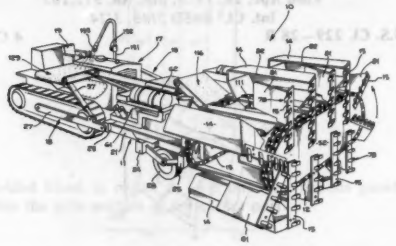
the improvement comprising a detachable strap, wherein said strap is a looped portion of one sidewall spaced from both ends and tacked to itself along a perforated heat seal line extending laterally substantially across one full side dimension of said sidewall at a location close to said top end, and means are provided in said sidewalls adjacent the middle of said strap for projecting the strap through said sidewalls to close the top of said bag and provide a carrying handle.

3,982,688

EARTH-MOVING APPARATUS

Charles G. Taylor, 4252 Fair Ave., Apt. 15, North Hollywood, Calif. 91602

Filed Nov. 25, 1974, Ser. No. 526,525
Int. Cl.² E21L *27/20*
U.S. Cl. 299—64 **9 Claims**



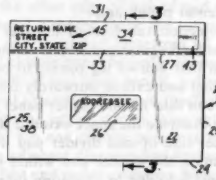
1. An excavator for use with a vehicle and comprising a frame, means for securing the frame to the vehicle, means for supporting the frame, a first conveyor wheel pair mounted to the frame to rotate in a plane perpendicular to the line of advance of the vehicle, a second conveyor wheel pair spaced from the first pair and mounted to the frame in a plane perpendicular to the line of advance of the vehicle; a digger conveyor on the wheel pairs, cutting means fixed to the digger conveyor, a portion of said cutting means extending outwardly from the conveyor in the direction of forward travel of the vehicle; drive means on the frame for rotating the conveyor wheel pairs, movable belts adapted to receive cuttings from the digger conveyor and delivering such cuttings outboard of the excavator, and control means for the wheel pairs drive means extending between the vehicle and the excavator frame.

3,982,689

RETURNABLE MAILING ENVELOPE

Fergus Retrum, 8708 - 14th Ave. South, Bloomington, Minn. 55420

Filed July 14, 1975, Ser. No. 595,571
Int. Cl.² B65D *27/04, 27/06, 27/34*
U.S. Cl. 229—71 **4 Claims**



1. In combination:

an envelope for two-way use and an enclosure for transmittal therein;

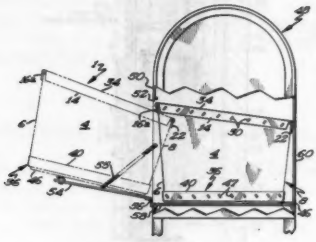
said envelope having a front panel with a transparent window spaced above a bottom edge thereof, and said enclosure having (a) a bottom edge, (b) a tear line spaced above said bottom edge by less than the spacing of said window above the bottom edge of said panel (c) a first address area spaced above said bottom edge of said enclosure by the spacing of said window above the bottom of said panel and (d) a second address area spaced above said tear line by the spacing of said window above the bottom edge of said panel.

3,982,690

MAIL BOX CONTAINER

Bradford J. Krizan, Plymouth, and James L. Pfaffendorf, Maple Grove, both of Minn., assignors to Liberty Carton Co., Minneapolis, Minn.

Filed Sept. 27, 1974, Ser. No. 509,922
Int. Cl.² B65D 91/00
U.S. Cl. 232—17 9 Claims



1. A material handling container comprising:

an upright portion formed from a single piece of fiberboard which is cut, scored and folded to form a pair of opposed, upright side walls and a pair of opposed, upright end walls extending therebetween, the upper and bottom edges of said side and end walls defining an open top and open bottom of the container, and said upright fiberboard portion being held in a generally rectangular shape by a substantially vertical joint formed between the free ends of said fiberboard piece between the end extremities of one of said upright walls;

a bottom portion in the form of a semi-rigid, moisture impervious, shallow base tray comprised in its entirety of a bottom panel extending between said upright side and end walls, and upstanding side and end panels overlapping only the bottom ends of said upright side and end walls and attached thereto, said base tray being formed as a unitary structure from a single piece of material, and the bottom edges of said upright, figerboard side and end walls abutting flush against the top face of said tray bottom panel;

a hinged flap on each of said side and end walls defined by score lines extending lengthwise of said side and end walls below the top extremities thereof, said flaps being folded downwardly along said hinge lines in overlapping relation to said side and end walls and attached thereto to define pockets on the upper ends of said side and end walls;

a completely cutaway segment at the top of each of said container end walls defining hand grip openings completely open across the top thereof and bounded by said overlapping flaps and pockets on each side thereof;

a rigid reinforcing rim of rectangular shape contained within said pockets and extending around the top of said container; and

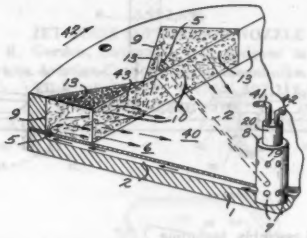
a pair of hand grips on opposite ends of said container formed by intermediate gripping portions of said reinforcing rim along opposite ends thereof disposed across the top of said hand grip openings, and the free ends of said single piece of fiberboard forming said side and end walls overlapping and being secured together along a substantially vertically extending joint formed in one of said end walls between the upright and extremities thereof, the upper end of said joint terminating at the bottom of the hand grip opening of said end wall spaced below one of said gripping portions of said reinforcing rim where there is no downwardly folded flap and thus only a single wall thickness of said free ends of overlap and secure together.

3,982,691

CENTRIFUGE SEPARATION AND WASHING DEVICE AND METHOD

Charles A. Schlutz, 7081 NW. 10th Place, Plantation, Fla. 33313

Filed Oct. 9, 1974, Ser. No. 513,509
Int. Cl.² B04B 7/16, 11/06, 15/12
U.S. Cl. 233—2 26 Claims



1. A centrifuge apparatus for separating and washing blood cells comprising:

1. enclosure means for enclosing a quantity of liquid suspended blood cells,

2. rotation means for rotating the enclosure means about the longitudinal axis thereof;

3. injector means for moving suspended blood cells and liquids into and out of said enclosure;

4. seal means for sealing the injector means to the enclosure means in a liquid-tight relationship;

5. a plurality of angularly shaped blood cell receiving means in fluid communication with each other and evenly spaced about the longitudinal periphery of the enclosure means and forming a part of the enclosure means, wherein at least one pair of opposite wall portions of each of the said receiving means converge towards the longitudinal periphery of the enclosure means and thereby forming a locus of maximum centrifugal force in the rotating enclosure at the apexes formed by the juncture of the converging wall portions;

6. a plurality of independent conduit means in fluid communication with each other, each with one end thereof in fluid communication with the said injector means and the other end thereof connected to the said locus of maximum centrifugal force;

7. power means for rotating the rotation means and enclosure means to a speed of angular rotation sufficient to separate the blood cells from the suspending liquid and compact the blood cells in the blood cell receiving means; and

8. control means for controlling liquid flows through the said injector means, conduit means, blood cell receiving means and enclosure means for flowing suspended blood cells into each of the blood cell receiving means, for flowing a wash liquid through each of the said conduit means and then through the compacted blood cells in each of the blood cell receiving means whereby the wash liquid passes through essentially all of the compacted blood cells, for flowing a resuspending liquid into the enclosure means and into the blood cell receiving means and for flowing resuspended blood cells from each of the said receiving means through each, respective, conduit means, through the injector means and out of the centrifuge apparatus.

3,982,692

CLAMPING MEANS FOR ELEVATOR GUIDE RAILS AND THE LIKE

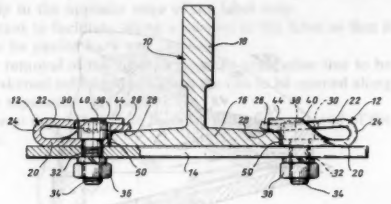
Klaus Feyrer, Esslingen, and Wolfgang P. Müeller, Lahr, both of Germany, assignors to R. Stahl Aufzuege GmbH, Stuttgart, Germany

Filed July 11, 1975, Ser. No. 594,957

Claims priority, application Germany, July 19, 1974, 2434806

Int. Cl.² E01B 9/34

U.S. Cl. 238—349 10 Claims



10. A rail assembly, including

a. a rail (10) having a generally T-shaped cross-sectional configuration, thereby defining rail foot (16) and rail head (18) portions;

b. a support (14) having a flat surface upon which the bottom of the foot portion of said rail is supported; and

c. a plurality of clamping means (12) connecting the foot portions of said rail with said support, each of said clamping means consisting solely of a unitary resilient metal blank having a generally U-shaped cross-sectional configuration and including

1. a flat fastening portion (20) connected with said support, said flat fastening portion including lateral stabilizing means (48, 50) in engagement with the corresponding lateral edge of the rail foot portion to prevent lateral movement of said rail relative to said support;

2. a spring blade portion (22) resiliently connected with said flat fastening portion and extending above said flat fastening portion and partially above said rail foot portion for biasing said rail into engagement with said support, thereby to permit limited displacement of said rail against the biasing force of said spring blade portion away from said support; and

3. at least one stop portion (44, 46) connected with said flat fastening portion and extending in spaced relation partially above said rail foot portion for limiting the extent of displacement of said rail away from said support.

3,982,693

ORIFICE PLUNGER VALVE FUEL INJECTOR

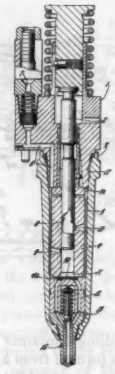
Kenneth L. Huising, Plymouth, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 16, 1976, Ser. No. 649,790

Int. Cl.² B05B 1/32; F02M 47/00

U.S. Cl. 239—88 7 Claims

1. In a fuel injection device, an injector body means having a stepped bore extending from one end thereof to define in sequence at least an annular sleeve wall and an enlarged spring chamber means closed at one end opposite said sleeve wall, said injector body means having a valve controlled fuel passage means therein connectable at one end to a source of high pressure fuel and having its other end in fluid communication with the portion of said stepped bore providing said sleeve wall a predetermined axial distance from said one end of said injector body means, a plunger valve having a first stem means slidably fitting a portion of said stepped bore forming said sleeve wall and having a second stem means loosely extending into said spring chamber means, said plunger valve having an internal passage means in fluid communication at one end with said fuel passage means and having its other end terminating adjacent to the end of said first stem means opposite said second stem means, spray orifices extending through said first stem means adjacent said one end to said internal passage means and defining with said one end a discharge end



of said first stem means, said plunger valve being movable in said stepped bore between a first position in which said discharge end is retracted within said sleeve wall to close off said spray orifices and a second position in which said discharge end is extended axially outward of said sleeve wall with said spray orifices then uncovered and, resilient means positioned within said spring chamber means to normally bias said plunger valve to said first position.

3,982,694

ACCUMULATOR TYPE FUEL INJECTION ASSEMBLY

John M. Bailey, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 29, 1975, Ser. No. 645,054

Int. Cl.² F02M 41/16; B05B 1/32

U.S. Cl. 239—96 19 Claims

1. A two phase fluid injector means for supplying primary injection of fluid to a user device followed by a secondary injection of fluid to said device, said injector means comprising:

inlet means for receiving fluid under pressure from a source;

first chamber means for receiving fluid from said inlet means;

first outlet means for communicating fluid from said injector means to said device;

first valve means disposed between said first chamber means and said first outlet means for controlling the flow of fluid from said first chamber means to said first outlet means;

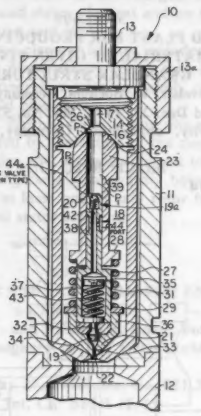
second outlet means for communicating fluid from said fluid injector means to said device;

accumulator chamber means disposed between said first chamber means and said second outlet means;

second valve means between said first chamber means and said accumulator chamber means for controlling the flow of fluid therebetween;

first biasing means for normally urging said first valve means to block the flow of fluid to said first outlet means, said second valve means including means for normally allowing flow of fluid from first chamber means to accumulator means and for normally blocking flow of fluid from accumulator chamber means to first chamber means;

third valve means disposed between said accumulator chamber means and said second outlet means; and



biasing means normally urging said third valve means to close off communication between said accumulator chamber means and said second outlet means.

3,982,695

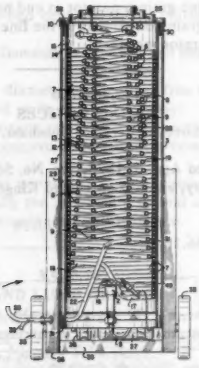
STEAM PRODUCING DEVICE

Lawrence Burchett, Leawood, and Vernon Adams, Shawnee Mission, both of Kans., assignors to Brute, Inc., Lenexa, Kans.

Filed June 23, 1975, Ser. No. 589,123

Int. Cl.² B05B *1/24*

U.S. Cl. 239—136 **2 Claims**



1. A steam producing device comprising:

a. a hollow housing having a side wall with an inner surface;

b. a pump operative to discharge water under pressure;

c. a coil arrangement within said housing and receiving water under pressure from said pump and including an intermediate coil spiraling downwardly in turns adjacent said inner surface and each other;

d. said coil arrangement including a warming coil spaced inwardly from said inner surface and intermediate coil and upstream from said intermediate coil, said warming coil receiving the lowest temperature water in said coil arrangement;

e. a burner within said housing and positioned generally axially within said intermediate coil whereby said intermediate coil substantially protects said inner surface from direct burner heat, said warming coil being positioned to absorb heat from said burner and heat water therein prior to entry of the water into said intermediate coil, whereby said intermediate coil does not promote sweating on said said wall; and

f. at least one additional coil downstream from said intermediate coil and connected to steam discharge means.

3,982,696

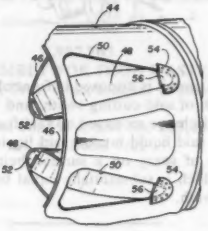
JET NOISE SUPPRESSOR NOZZLE

Walter R. Gordon, Savannah, Ga., assignor to Grumman American Aviation Corporation, Savannah, Ga.

Filed July 1, 1975, Ser. No. 592,218

Int. Cl.² B64D *33/06*

U.S. Cl. 239—265.17 **10 Claims**



1. In a jet engine exhaust nozzle through which thrust gas of an engine is discharged and about which flows a boundary layer stream which nozzle has at least one flush inlet for at least one chute extending inwardly through the wall thereof, a means to direct said stream into and through said chute, said means comprising:

a ramp at a leading edge of the flush inlet, said ramp extending aft over a portion of the chute and terminating in an edge above the chute and within the chute aft of the inlet; and,

means to direct a portion of the thrust gases of the engine under the ramp to emerge under the edge thereof within the chute aft of the inlet.

3,982,697

SPRAYING APPARATUS

H. Eugene Maples, 280 Pee Dee Road, Southern Pines, N.C. 28387

Filed June 18, 1975, Ser. No. 588,048

Int. Cl.² A01D *43/00*; B05B *15/04*, *17/00*

U.S. Cl. 239—289 **7 Claims**

1. A liquid spraying apparatus for use in combination with a self propelled mower having a cutting swath of a given width comprising:

a. a frame adapted to be attached to said mower, said frame including a vertically extending section which extends above the top of said mower when said frame is attached to said mower;

b. a remote liquid supply source;

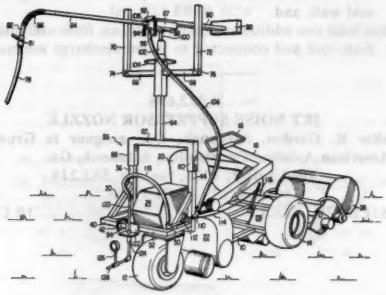
c. a liquid intake mounted on said vertically extending section at a position above the top of said mower for receiving liquid from said remote liquid supply source, said liquid intake including,

i. an intake conduit extending toward the rear of said mower, said conduit having an intake end adapted for communication with said remote liquid supply source

and a discharge end communicating with a liquid discharge,

ii. a pivotal connector supporting said intake conduit permitting free rotation of said intake conduit during mowing by said mower, and

iii. means for preventing said intake conduit from pivoting on said connector to an orientation wherein said



intake conduit is disposed in front of said mower above the path of said cutting swath; and

c. a liquid discharge mounted on said frame in communication with said liquid intake, said liquid discharge having a pattern of spray on a surface being mowed by said mower which is substantially equal to the width of said cutting swath.

3,982,698

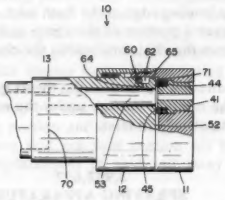
NOZZLE SELECTOR VALVE

Arthur A. Anderson, St. Paul, Minn., assignor to Specialty Manufacturing Company, St. Paul, Minn.

Filed Jan. 29, 1976, Ser. No. 653,448

Int. Cl.² B05B 1/12, 1/16

U.S. Cl. 239—394 **7 Claims**



1. A high pressure sprayer operable for indexing to a particular nozzle while a source of high pressure fluid is in fluid communication with the sprayer comprising:

a body for connecting to a high pressure source, said body having a chamber therein for receiving the high pressure fluid and a face for engaging a sliding seal;

a head rotatably mounted to said body, said body and said head coacting to define a second chamber;

a sealing member located between said body and said head to prevent leakage of high pressure fluid therebetween;

a nozzle insert located in said head, said nozzle insert operable for directing high pressure fluid therethrough;

sealing means located around said nozzle insert for preventing leakage of high pressure fluid between said nozzle insert and said head;

a passageway located in said body and connecting said first chamber to said second chamber so that high pressure fluid is located on the outside of said seal means and the inside of said sealing means to thereby enable an operator to rotate said nozzle insert with respect to said body without damaging said seal.

3,982,699

METHOD AND PLANT FOR PRODUCING CEMENT OR OTHER MATERIAL OF GIVEN FINENESS AND GRANULAR STRUCTURE

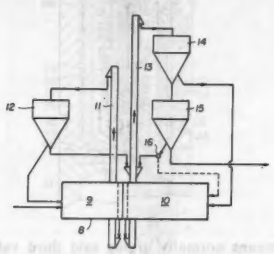
Heinz Jäger, Nevelstr. 40, Bochum, Germany 4630

Filed Dec. 23, 1974, Ser. No. 535,690

Claims priority, application Germany, Dec. 22, 1973, 2364277

Int. Cl.² B02C 23/12

U.S. Cl. 241—14 **8 Claims**



1. Method of producing cement or other material of given fineness and granular structure which comprises delivering material to be reduced into a first individual chamber of a tube mill having two adjacent grinding chambers, said chambers having no direct connection with each other, delivering the ground material from each of the chambers to coarse-grain separator means associated with the chambers, separating a fines-free coarse-grain component in the coarse-grain separator means and returning the coarse-grain component to one of the adjacent chambers, feeding the fines component of the coarse-grain separator means to a fine-grain separator, separating a fine-grain component from a coarse-grain component in the fine-grain separator, withdrawing the fine-grain component from the fine-grain separator as end product, and returning the coarse-grain component of the fine-grain separator to the coarse separator means.

3,982,700

MIXING DEVICES

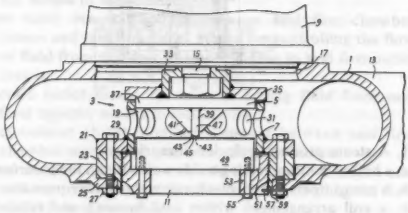
Gordon David Love, Waterside, Chesham, Buckinghamshire, England

Filed Apr. 3, 1975, Ser. No. 564,802

Claims priority, application United Kingdom, Apr. 3, 1974, 14812/74

Int. Cl.² B02C 23/36

U.S. Cl. 241—46.11 **7 Claims**



1. A mixing device, comprising:

a rotor element which comprises an elongated shaft, a rotor plate mounted on said shaft, and a plurality of rotor blades outstanding from one side of said rotor plate; and

a stator element which comprises a generally cylindrical side wall having an inlet at one end of said cylinder, and outlet means formed in said side wall;

wherein said rotor element is arranged with said rotor blades within said stator element and on the side of said rotor plate facing said inlet;

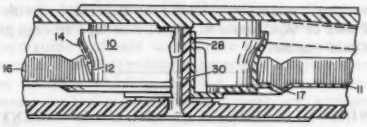
wherein said stator element further includes a stator blade which extends diametrically across said inlet and is arranged for cooperation with an axially outer end of at least one of said blades;

whereby, in use, fibrous material entering said stator element is shredded by the action of the cooperating rotor and stator blades and is then subjected to high shearing forces in moving radially outwardly between a radially outer edge of at least one of said rotor blades and said side wall of said stator element.

3,982,701
ONE PIECE CORE AND PLATFORM FOR ENDLESS TAPE CARTRIDGES

David O. Courtney, and Richard E. Coats, both of Excelsior Springs, Mo., assignors to The Gates Rubber Company, Denver, Colo.

Filed May 27, 1975, Ser. No. 581,308
Int. Cl.² B65H 17/48
U.S. Cl. 242—55.19 A **8 Claims**



1. An integrally molded platform and core for carrying an endless array of magnetic tape for use in a cartridge comprising:

a disc-shaped platform for holding the lower edge of the array of tape;

a core integrally molded centrally to the platform, said core having:

a minimum outer diameter at its lower end connected to the platform,

a maximum outer diameter at its upper free end,

said core defined at its outer surface by:

an outward convex upper free end portion, and

an outward concave lower portion connected to the platform,

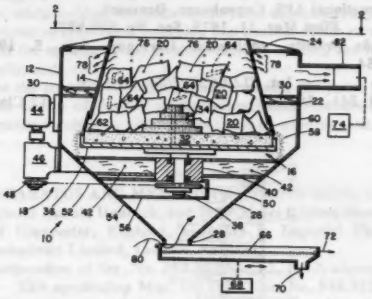
said portions connected at a common tangent point at generally the mid-height of said core to form a smooth, continuous outer surface.

3,982,702
SAND LUMP GRINDER

Donald M. Barnhart, Martinsburgh, W. Va., and James H. Carpenter, Jr., Hagerstown, Md., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed Mar. 6, 1975, Ser. No. 556,021
Int. Cl.² B02C 7/11
U.S. Cl. 241—58 **20 Claims**

1. Apparatus for reducing lumps of material to particles, said apparatus comprising a tub including an annular wall, an upper opening in said tub for receiving lumps of material and a lower opening for discharging particles from said tub; abrasive means located adjacent said lower opening for coming into rubbing contact with lumps of material, drive means for driving said abrasive means for abrading said lumps of material into particles, said abrasive means being spaced from said annular wall for providing an exit space for allowing particles to exit from said tub, said apparatus further including an outer housing substantially enclosing said tub except for said upper

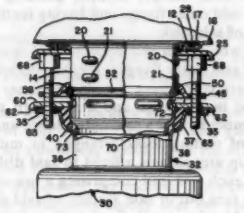


opening, and means for creating a flow of air into said upper opening and into said outer housing for ventilating said tub.

3,982,703
MOUNTING ASSEMBLY FOR FOOD WASTE DISPOSER

Theodore F. Meyers, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed June 26, 1974, Ser. No. 483,456
Int. Cl.² B02B 7/02
U.S. Cl. 241—100.5 **22 Claims**



1. A mounting assembly for attaching a food waste disposer to a sink, comprising a sink flange which is adapted to be inserted into the drain opening in the sink with a flared top overlying the drain opening and an enlongated neck extending through said opening below the sink, an annular pressure plate received on the said neck in underlying relation to said sink, cooperating interlocking means on said plate and neck engageable by rotation of said plate on said neck temporarily retaining said flange in assembled relation on the sink while providing for unrestricted movement of said plate upwardly against the bottom of the sink, annular groove means formed in said neck in spaced relation to said interlocking means, said disposer having an inlet adapted to be received telescopically over said flange neck, a ring retainer assembly on said disposer at said inlet having an annular snap ring engageable with said groove means upon lifting said disposer over said neck and providing for the self-holding of said disposer in suspended relation on said flange when released, said disposer being free to be rotated with respect to said flange while so suspended to provide for the making of electrical and drain connections, and jack screw means extending between said disposer and said pressure plate for lifting said pressure plate from said neck interlocking means against the bottom of the sink and securing said disposer and flange against rotational movement.

3,982,704

GRINDING DISK FOR DISK MILLS

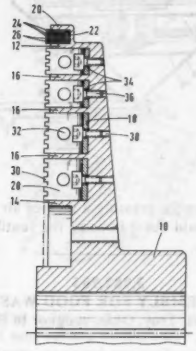
Leslie Palyi, Don Mills, Canada, assignor to Palyi-Hansen International APS, Copenhagen, Denmark

Filed Mar. 21, 1975, Ser. No. 560,985

Claims priority, application Germany, Apr. 5, 1974, 2416654

Int. Cl.² B02C 7/04, 7/12

U.S. Cl. 241—298 12 Claims



1. A grinding disk for a disk mill, said disk comprising:

a radially inner mounting flange;

a radially outer mounting flange spaced radially outwardly from said inner flange; toothed grinding blade means carried in said outer flange and having teeth facing out of a surface of said disk;

at least one web positioned between and spaced from said inner and said outer flanges, thereby defining a plurality of chambers comprising a radaially inner chamber between said inner flange and a said web and a radially outer chamber between said outer flange and a said web;

a plurality of cutting tools arranged in mutually spaced relationship around and affixed to said disk in each said chamber; each said tool comprising a row of teeth and all said teeth face out of said surface of said disk; each said tool row of teeth extending generally radially of said disk; each said row of teeth in one said chamber being near, in an annular direction around said disk, at least one said row of teeth in the annular adjacent said chamber, at least some of said rows of teeth in each said chamber being annularly offset from the said near row of teeth in the radially adjacent said chamber.

3,982,705

SLIDERLESS SHUTTLE AND WIRE GUIDE ASSEMBLY

Raymond A. Peck, New Fairfield, and Leon J. Yarrish, Danbury, both of Conn., assignors to Park Lane Research Corporation, Danbury, Conn.

Filed Apr. 23, 1975, Ser. No. 570,860

Int. Cl.² H01F 41/08

U.S. Cl. 242—4 B 11 Claims

1. An improved toroidal coil winding shuttle assembly incorporating:

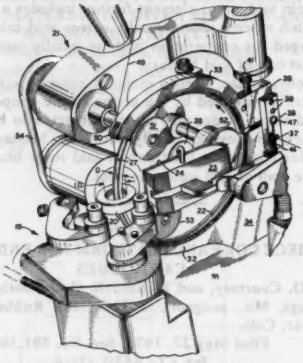
A. a scarf-jointed ring-shaped sliderless shuttle adapted to be interlinked in relative rotatable engagement with a toroidal core and having a wire or tape storage groove facing radially outward formed around its periphery,

B. supporting means positioning the shuttle for relative rotational interlinked movement through the central aperture of the toroidal core,

C. shuttle-engaging drive means providing driving torque causing said shuttle to rotate about its axis, and

D. a core-supporting and driving core holder positioning a toroidal core interlinked with said shuttle and causing said core to rotate about its own axis,

E. wherein the improvement comprises a concave wire guide embracing a substantial portion of the outer periph-



eral rim of said shuttle and incorporating depressible friction material protruding inwardly therefrom into brushing engagement with the shuttle's rim and with turns of wire or tape would in the wire or tape storage groove of said shuttle.

3,982,706

WINDING MACHINES HAVING INDEPENDENT SPINDLES

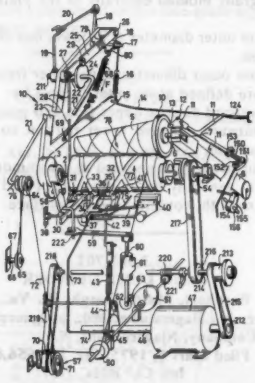
Dominique Delerue, 43, rue de la Briqueterie, 59240 Mouvaux, France

Filed Nov. 10, 1975, Ser. No. 630,215

Claims priority, application France, Nov. 12, 1974, 74.40649; Nov. 12, 1974, 74.40650; Jan. 30, 1975, 75.03634

Int. Cl.² B65H 54/38

U.S. Cl. 242—18.1 27 Claims



1. In a winding machine having independent spindles with a control motor, and cooperative actuating members driving a grooved yarn-guide, the latter in turn driving bobbins preventing winding irregularities of yarn which is supplied and then fed to the bobbins winding at high speeds from hanks, cops, cakes or the like, namely winding machines having a conical bobbin which rests on a cylindrical yarn-guide having helical grooves generally with two opposing pitches which distributes the yarn uniformly on the bobbin, the latter resting

under its own weight above the yarn-guide which drives the bobbin by frictional resistance, the yarn-guide and the bobbin, respectively, being mounted on a shaft having ends, and defining two axes, respectively, the axis of the bobbin moving progressively away from the axis of the yarn-guide as the yarn is being wound while forming normally in a plane common to the two axes a small or zero angle with the axis of the cylindrical yarn-guide, including a device for preventing the yarn from collecting at certain preferential points of the bobbin at certain winding speeds, and including a yarn break detector, the improvement comprising

means for oscillating at least one of th ends of the shaft of the yarn-guide and of the bobbin with an alternating relative oscillatory movement substantially perpendicular to an operative plane defined by the two axes of the yarn-guide and of the bobbin, respectively, without causing any substantial vertical oscillation of the bobbin,

modulated action means operatively cooperating with the oscillation of the yarn-guide and of the bobbin, respectively, for retaining the yarn in a groove of the yarn-guide for any operative positon of the axis of the yarn-guide with respect to the axis of the bobbin,

second means, in operative combination with said modulated action means, for preventing a faulty movement of the yarn with respect to the axis of the bobbin both at a time of starting and at a time of braking, comprising

torque converter means for providing a uniform and moderate torque on the yarn-guide at the time of starting,

automatic braking means for intensive simultaneous stopping of said control motor, of said bobbin, and of said yarn-guide and said cooperative actuating members as soon as a predetermined exaggerated traction is exerted by the yarn which is supplied, said automatic braking means for braking the bobbin abruptly and with priority, and

means for tensioning the yarn which is fed for preventing slipping thereof.

3,982,707

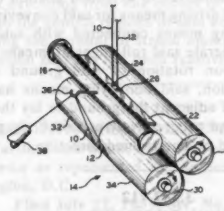
METHOD AND APPARATUS FOR THE PRODUCTION OF TWO PACKAGES OF YARN WITH TRANSFER TAILS

Ralph Saleeby, Wilson, N.C., assignor to Phillips Fibers Corporation, Greenville, S.C.

Filed Feb. 10, 1975, Ser. No. 548,583

Int. Cl.² B65H *54/02, 65/00*

U.S. Cl. 242—18 PW **8 Claims**



1. A method for producing two packages of yarn with yarn transfer tails on a winder simultaneously, wherein the winder has a friction roll, a dual traversing means with two traverse guides and two bobbins on a chuck and wherein the chuck is positioned adjacent the traversing means and the friction roll is positioned adjacent the traverse guides of the traversing means and against the chuck, said method comprising:

passing two yarns between the traversing means and the friction roll and then between the chuck and the friction roll while holding the yarns approximately in the center of the traversing means and out of the traverse guides;

passing said yarns partially around the bobbins on the chuck, and then while holding the yarns partially off the surface of the bobbins, passing the yarns between the traversing means and the chuck and again between the chuck and the friction roll;

then while holding the ends of the yarns approximately in the center of the chuck, releasing that portion of the yarns held off the surface of the bobbins thereby winding the transfer tails; and

after the transfer tails are wound, releasing the yarns held in the center of the traversing means thereby permitting the traverse guides to pick up the yarns to wind the packages.

3,982,708

APPARATUS AND METHOD FOR PROCESSING YARN

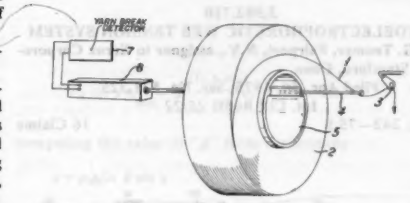
Reginald Ronald Hancock, and Peter James Reuben Maw, both of Gloucester, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 294,081, Oct. 2, 1972, abandoned. This application Mar. 10, 1975, Ser. No. 556,952

Claims priority, application United Kingdom, Oct. 4, 1971, 46043/71

Int. Cl.² B65H *63/00*

U.S. Cl. 242—36 **5 Claims**



1. In apparatus for interrupting a running yarn unwound overend from a wound package wherein a yarn balloon is formed by the running yarn, breaking the yarn and holding the upstream end thereof in response to an unwinding malfunction: an elongate member located within said yarn balloon and normally out of contact with said running yarn and means responsive to an unwinding malfunction for introducing said elongate member into the path of the running yarn such that the yarn wraps itslf around the member in a number of helical turns until held sufficiently tightly that the yarn breaks and unwinding ceases.

3,982,709

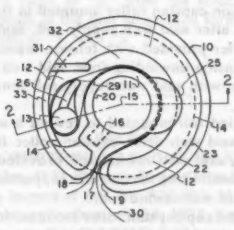
FILM CORE WITH RESTRAINER

Heinz E. Hertel, Mount Prospect, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Aug. 18, 1975, Ser. No. 605,487

Int. Cl.² B65H *75/28*

U.S. Cl. 242—74 **11 Claims**



1. A core for holding web material comprising:

a first cylinder having an axis of rotation and an axially extending slot for receiving the web material;

a second cylinder within said first cylinder and substantially concentric with said first cylinder about said axis of rotation to thereby form an annular channel between the outer peripheral surface of said second cylinder and the inner surface of said first cylinder, said annular channel communicating with said axial slot;

spacing means between said first and second cylinders to thereby maintain said first and second cylinders in fixed substantially concentric relation; and

a post within said annular chanel and angularly spaced from said axial slot beyond the point of tangency between said slot and the outer peripheral surface of said second cylinder; whereby;

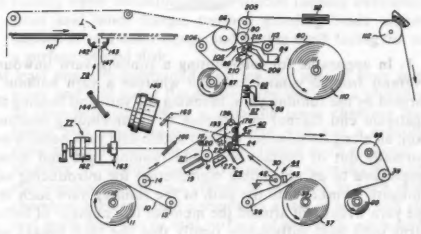
with the end of the web material threaded through said slot into said annular channel, along the outer peripheral surface of said second cylinder, around said post, back through said channel, and out said slot, the conjoint action of the restraining effect of said post on the web material and the frictional contact between the resulting two layers of web material about the outer peripheral surface of said second cylinder securely holds the web not withstanding pulling forces applied to the web.

3,982,710

PHOTOELECTROPHORETIC WEB TENSION SYSTEM

Roger G. Teumer, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 24, 1975, Ser. No. 571,325
Int. Cl.² B65H *25/22*
U.S. Cl. 242—75.5 **16 Claims**



1. A web tension system for controlling web tension comprising in combination:

a. a web supply roll mounted to support a web for travel, said web supply roll provided with tension means for controlling tension of a supported web unwinding from said web supply roll;

b. a web drive capstan roller for driving a supported web through friction contact therewith from said web supply roll at constant velocity;

c. a web friction capstan roller mounted in the direction of web travel after said web supply roll, said web friction capstan roller provided with tension means for controlling web tension unwinding from said web supply roll in cooperation with said web supply roll tension means in (a) above;

d. a web rewind roll mounted to rewind a supported web driven by said web drive capstan roller from said web supply roll, said web rewind roll provided with tension means for controlling tension of a supported web rewinding onto said web rewind roll;

e. a first web takeup capstan roller mounted in the direction of web travel before said web rewind roll, said web takeup capstan roller provided with tension means for controlling web tension rewinding onto said web rewind roll in cooperation with said web rewind roll tension means in (d) above;

f. takeup drive means for driving said web rewind roll and said web takeup capstan roller at the desired speeds; and

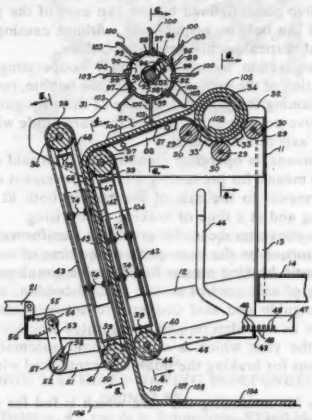
g. main drive means for driving said web drive capstan roller at the desired speed.

3,982,711

SOD LAYING MACHINE

Frank M. Bradley, Box 255, Rte. 1, Diamond, Mo. 64840, and Larry D. Markle, R.R. 1, Aurora, Mo. 65605

Filed Apr. 9, 1975, Ser. No. 566,377
Int. Cl.² B65H *17/46*; A01B *45/00*
U.S. Cl. 242—86.52 **35 Claims**



1. A sod laying machine having a body portion, rotatable ground engaging body portion supporting means thereon, means for moving said body portion over the ground in a predetermined direction to rotate said ground engaging supporting means in a predetermined direction, means on said body portion rotatably supporting a plurality of rolls of lengths of sod, said supporting means supporting said rolls in end to end adjacency, conveying means on said body portion, means engaging said rolls to transfer said lengths of sod from said rolls lengthwise of themselves in extended postion onto said conveying means, and driving means for said conveying means and said roll engaging means connected with said ground engaging means to operate said roll engaging means and said conveying means upon rotation of said ground engaging means in said direction, said conveying means having the discharge end thereof adjacent the ground to lay the lengths of sod onto the ground progressively as said body portion is moved thereon in said predetermined direction.

3,982,712

COIL DISPENSER

Eugene E. Bassett, Box 298-R.F.D. No. 2, Lisbon, Conn. 06351

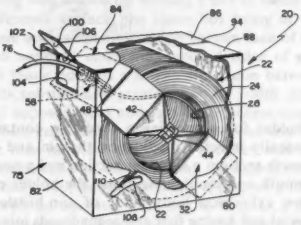
Filed Nov. 28, 1975, Ser. No. 632,289
Int. Cl.² B65H *49/18*, *49/00*; B65D *85/66*
U.S. Cl. 242—129 **15 Claims**

9. An assembly for packaging strand material in the form of a coil having a top and a bottom and an axial passage extending therethrough between the top and the bottom comprising:

at least one elongated strip conformed to embrace the outer surface of the coil generally diametrically and across its projected surface in a continuous loop, said strip having one end with a slot therein and another end having a tab compatible for reception within the slot to thereby maintain said strip in a contiguous relationship with the coil, and a pair of separated pyramid-shaped members inter-

mediate said ends which project into the axial passage of the coil, respectively, from opposite directions;

a hollow feed tube extending radially through the windings of the coil between an inner end at the axial passage, and an outer end at the outer surface of the coil and positioned intermediate its top and the bottom of the coil, said tube lying within a plane containing all elements of said strip and including a pair of spaced flanges extending radially outwardly from the outer surface thereof adjacent the outer surface of the coil, said flanges defining an annulus therebetween adapted for the snug reception therewithin of said slotted end thereby cooperating with said tab and the slot to maintain said strip in a contiguous relationship with the coil, said tube further having a bore extending therethrough for receiving and guiding an end of the strand material from the passage as it is being unwound; and



a regular slotted carton for supporting the coil and said strip therein, said carton having a pair of opposed major side walls, a pair of opposed minor side walls, and a pair of opposed end walls, the top and bottom of the coil being generally contiguous with a respective one of said major side walls, one of said minor side walls having a flap associated with the outer end of said tube adjacent a corner of said carton defined by the intersection of said minor side wall with one of said end walls, said flap being defined by tearable perforations and including a hinge portion such that when said perforations are fully torn, said flap is movable about said hinge portion between a closed position and an open position to accomodate selective withdrawal of the strand material from the coil, said major side walls including a removable tab defining a slot extending from one corner of said carton to a location in the central regions of said one major side wall for viewing the amount of strand material remaining on the coil when said tab has been removed.

3,982,713

BALLISTIC MISSILE DEFENSE SYSTEM

John J. Martin, South Bend, Ind., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

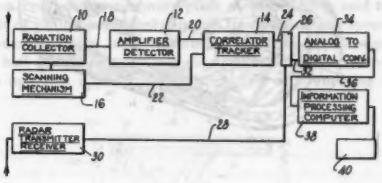
Filed July 22, 1959, Ser. No. 829,188
Int. Cl.² F41G 9/00
U.S. Cl. 244—3.1 8 Claims

1. The method of determining the trajectory of a ballistic missile having a trajectory substantially defined by the formula:

$$\ddot{y} = -g + \rho_{oo} g (\dot{y})^2 / 2\beta \sin\gamma$$

$$\ddot{x} = \rho_{oo} g (\dot{x})^2 / 2\beta \cos\gamma 2$$

comprising the steps of measuring the velocity and flight path angle of the missile at a reference altitude, measuring the radiation emitted by the gases in the proximate environment of the missile, measuring the time required for the missile to travel from the reference altitude to the occurrence of maximum radiation, measuring the altitude at which maximum radiation occurs, computing the value of "a" from the following formula:



$$V_E \sin\gamma \, i_{t_{max}} = \int_{y_o}^{(\ln p\, a)/c} e^{ac-2y} dy$$

computing the value of "β" from the formula:

$$a = \rho_{oo} g / 2c \, \beta \sin\gamma$$

where

V = velocity at altitude y
V_E = velocity at altitude y_o
γ = flight path angle
e = base of natural logarithms
c = constant
$a = 92_{oo} g / 2c\beta \sin\gamma$
ρ_o = density of the atmosphere at sea level
ρ_{oo} = density of the atmosphere at altitude "y"
g = acceleration due to gravity
β = ballistic coefficient
p = constant
$t_{1_{max}}$ = time required for missile to travel from altitude y_o to y
y = altitude at which maximum radiation occurs = $(\ln p\, a)/c$
y_o = reference altitude
$\dot{y}$ = first derivative of altitude with respect to time
$\ddot{y}$ = second derivative of altitude with respect to time
$\dot{x}$ = first derivative of distance in the horizontal plane with respect to time
$\ddot{x}$ = second derivative of distance in the horizontal plane with respect to time

substituting the value of "β" from the solution of the last mentioned formula in the first mentioned formulas and computing the values of "$\ddot{y}$" and "$\ddot{x}$"

3,982,714

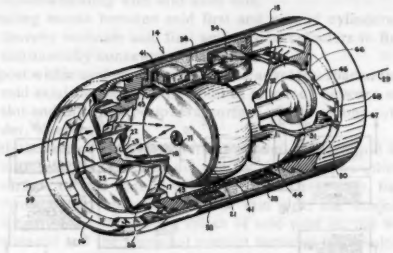
PROPORTIONAL LEAD GUIDANCE

Harland L. Kuhn, 4611 Raymar Drive, Orlando, Fla. 32809

Continuation-in-part of Ser. No. 828,804, May 26, 1969, abandoned. This application July 24, 1972, Ser. No. 274,683
Int. Cl.² F41G 7/00
U.S. Cl. 244—3.16 26 Claims

1. An inertially stabilized seeker comprising a housing, a stabilized seeker element operatively disposed in said housing, and passive coupling means in said seeker functioning to cause

said seeker element to move to orient itself with said housing, such movements taking place at a rate proportional to any



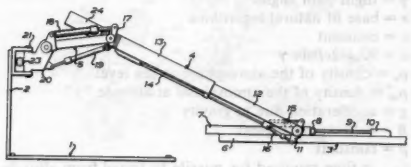
displacement angle between the seeker element axis and the housing axis.

3,982,715

ADJUSTABLE TOOL POSITIONING STRUCTURE

Kenneth Lindgren, and Sten Erlandsson, both of Borlange, Sweden, assignors to Verkstadsproduktion I Borlange AB, Sweden

Filed Dec. 16, 1975, Ser. No. 641,209
Claims priority, application Sweden, Dec. 17, 1974, 7415823
Int. Cl.[2] E21C 9/00, 5/08
U.S. Cl. 248—2 3 Claims



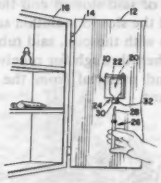
1. Adjustable tool positioning structure comprising:— a base; a member which is mounted on the base and pivotable in a first plane; a link which at one of its ends is hingedly connected to said member and is pivotable in a plane generally perpendicular to said first plane; an arm which is at one end hingedly connected by means of a joint to the other end of the link and includes, for the adjustment of the arm length, a first element connected with the joint and a second element which is movable relative to said first element; said link and said arm being interconnected such that the arm is pivotable about a pivot axis which is fixed relative to the link; and a tool support whicih is hingedly connected to the other end of the arm and which includes, for the adjustment of the support length, a first element hingedly connected to the movable element of the arm and a second element movable relative to the last-mentioned first element; said tool support being designed to support a tool so that the longitudinal axis of the tool is generally parallel to the longitudinal axis of the support; wherein the arm is mounted in the joint and rotatable about its own longitudinal axis such that its axis of rotation and its axis of pivoting intersect in the joint, and wherein the arm and the tool support are so arranged that in any of the positions of rotation of the arm they will lie in a generally common plane which is independent of the relative pivoting position of the arm and the tool support.

3,982,716

MEDICAL BOTTLE HOLDER

Alonzo Trees, 300 Carrington Road, Waterloo, Iowa 50701

Filed Sept. 24, 1975, Ser. No. 616,124
Int. Cl.[2] A61B 19/00; A47G 29/02; B65D 23/10
U.S. Cl. 248—206 A 2 Claims



1. A holder for supporting a medicine container having hypodermically injected medication therein and including a sealed mouth section, a shoulder section and a neck connecting the mouth and shoulder sections, the holder comprising:

a hollow cylindrical body made of non-brittle, insulating material and having first and second ends joined by a side wall and a chamber defined therein for accommodating the medicine container;

an end cover including a plug mounted on said body first end having a neck receiving passage for permitting the medicine container mouth section and neck to project through said end cover with the mouth section exterior of the housing when the container is accommodated in said chamber, said cover defining a shoulder interiorly of the housing for abutting the medicine container shoulder to support the medicine container in a stationary manner in said chamber with the mouth section projecting through said end cover, said plug including a plug end positioned inside said chamber with said shoulder being a frusto-conically shaped surface connecting said plug end and said neck receiving passage;

a circular closure cap pivotally connected at a side edge thereof to said body second end for pivotal movement in a plane parallel to a plane containing said second end so that said cap slidably engages said second end to selectively cover and uncover said body second end to enable a medicine container to be placed in and removed from said chamber and to hold the container in place in said chamber when a piercing needle is being forced through the sealed mouth section;

a pivot pin comprised of a screw-like element penetrating through said cap and into said container side wall to form a pivot axis for said cap which is essentially parallel to the longitudinal axis of said cylindrical body for pivotally connecting said cap to said body;

means for pivoting said closure cap;

an elongated magnet on one side of said body detachably securing said body to a supporting means; and

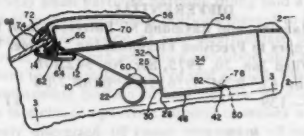
means fixing said magnet to said body so that said magnet is longitudinally aligned with said body, attaching means being fixed to said magnet for essentially the entire length thereof and engaged against said body for essentially the entire length thereof so that said body and said magnet are fixed together for essentially the entire lengths thereof and are essentially immovable with respect to each other thereby adapting said holder to be fixed to said supporting means over essentially the entire length of said holder so that the medicine container will be rigidly and fixedly held in place when it is accommodated in said chamber with said closure cap closed.

3,982,717

HOLDER FOR TISSUE BOXES

Richard Pavelle, 3 Fieldstone Drive, and Leon A. Ferber, 48 Lake Ave., both of Woburn, Mass. 01801

Filed Aug. 12, 1974, Ser. No. 496,804
Int. Cl.² F16M 13/02
U.S. Cl. 248—313 1 Claim



1. In a spring wire device for holding a box of tissue in place against a reference surface, the tissue box being of the type having a tissue access opening on the bottom face of said box between two opposed ends and opposed sides of said box wherein said tissue box has a length dimension between said opposed ends substantially greater than its width dimension between said opposed sides and said tissue access opening on said bottom face has a length dimension between said opposed ends greater than its width dimension between said opposed sides, the combination of an anchoring formation comprised of a substantially 360° bend in a single spring wire forming a bifurcation with an opening sufficient to receive a fastening member therethrough for anchoring said holding device in place, said wire extending from said 360° anchoring formation bend in the form of two spring legs with each leg having a spring loop distal from the anchoring formation, a spring leg extension from each spring loop followed by a pair of substantially right angle bends in the spring wire of each of said legs to form a stop formation in each of said leg extensions for engagement with one of said box ends, a further leg extension extending from each of said stop formations for supplying lift support at said tissue box face, a further stop formation in each of said further leg extensions being comprised of a substanitally right angle bend in each of said further leg extensions for engaging the other said box ends, and a transvers member fixed to said further leg extensions to firmly hold said further leg extensions a fixed distance from each other on respective sides of said tissue access opening and having upwardly directed end extensions with each end extension at a substantially right angle to said transverse member for engaging said box sides to provide with the other stop formations resistance to lateral movement of said box.

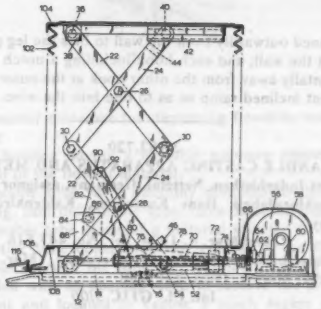
3,982,718

OPERATORY CHAIR OPERATING MECHANISM

Richard P. Folkenroth; William G. Mader, both of York, and Ralph J. Williams, New Oxford, all of Pa., assignors to Dentsply Research & Development Corporation, Milford, Del.

Filed July 31, 1975, Ser. No. 600,703
Int. Cl.² F16M 13/00; B66B 11/04
U.S. Cl. 248—421 5 Claims

1. An operatory chair base comprising in combination, a support member adapted to have a seat for an operatory chair attached thereto for positioning said seat at desired vertical positions within predetermined limits above a supporting surface, base means adapted to be positioned upon said supporting surface, a pair of parallel lazy tong assemblies each comprising pairs of crossed links pivotally connected to each other and said assemblies being operable within vertical planes spaced transversely apart a limited distance and positioned for operation between said support member and base means, means pivotally connecting one end of certain of said links respectively to said base means and said support member and the corresponding ends of certain other of said links respectively being slidably connected to said base means and support member, said assemblies being operable in unison when extended and retracted respectively to raise and lower said support member relative to said base means, pivot means connecting at least one pair of said links of each assembly intermediately of the ends thereof, a linkage system supported by said base means and interconnected respectively to said pivot means for said one pair of links of each assembly thereof and operable when moved in opposite directions to move said pairs of links of said lazy tong assembly in corresponding contracting and expanding vertical directions to move said support member in similar vertical directions, said linkage system comprising stationary pivot means fixed to said base, a pair of similar bell cranks spaced transversely and mounted between said lazy tong assemblies, pivot means connecting said bell cranks to said stationary pivot means, a transverse yoke operable adjacent said base, a pair of connecting rods



connected at opposite ends respectively to said yoke and similar ends of said bell cranks, a pair of connecting links connected at opposite ends respectively to the other similar ends of said bell cranks and said pivot means of said one pair of links of each assembly, and power means connected to said linkage system to operate the same in at least one direction to move said lazy tong assembly in expanding direction, said power means comprising a reversible electric motor supported by said base, a drive screw extending along said base and connected at one end to said motor for operation of said screw selectively in opposite directions, bearing blocks fixed to said base and respectively supporting said screw adjacent opposite ends thereof, and said transverse yoke having a threaded bore receiving said screw and being movable by said screw in opposite selected directions to actuate said linkage system to raise and lower said support member relative to said base.

3,982,719

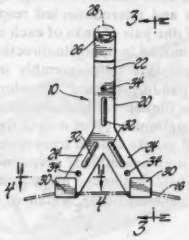
PICTURE HANGER

George B. Kilborne, 216 Bermuda Lane, Palm Beach, Fla. 33480

Filed Nov. 28, 1975, Ser. No. 636,344
Int. Cl.² A47G 1/16
U.S. Cl. 248—489 3 Claims

1. A hanger for pictures or the like, the hanger comprising: a metallic body of a stamped construction that includes an upper leg and a pair of lower legs arranged in an inverted Y shape; the upper leg including an aperture for receiving a nail that is adaptable to suspend the hanger on a wall, the force of gravity pivotally positioning the hanger about the nail in a downwardly depending orientation; the lower legs including a pair of laterally spaced wire receiving hooks located on opposite sides of the aperture the same lateral distance; the wire receiving hooks being leveled with each other by gravity during suspension of the hanger and the hooks being adaptable to receive a laterally extending wire or the like on a picture to be hung so that laterally spaced support of the wire prevents pivoting of the picture about the hanger; each leg including a

projection that extends rearwardly to engage the wall; each hook including an inclined ramp that extends outwardly and downwardly from the associated leg so that the picture wire is



positioned outwardly from the wall to bias the leg projections against the wall; and each hook including a notch that opens horizontally away from the other hook at the outer end of the adjacent inclined ramp so as to bite into the wire.

3,982,720

CANDLE CASTING APPARATUS AND METHOD

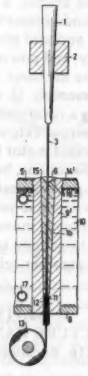
Herbert Inderbiethen, Nettetal, Germany, assignor to Spezial-Maschinenfabrik Hans Kurschner, Kaldenkirchen, Germany

Filed Mar. 4, 1974, Ser. No. 447,516

Claims priority, application Germany, Mar. 9, 1973, 2311699; Mar. 9, 1973, 2311700

Int. Cl.² G11C *5/00*

U.S. Cl. 249—81 **9 Claims**



1. A candle casting apparatus comprising:

a. a plurality of tubular candle casting molds, each mold having an axis and an axial bore;

b. a housing defining an enclosure and having a top plate and a bottom plate spaced from said top plate,

1. said plates being formed with respective aligned openings,

2. an exposed surface portion of said top plate extending in a closed loop about each opening in said top plate and separating the associated opening from the other openings in said top plate,

3. each of said molds being received in a respective opening of said top plate and an aligned opening of said bottom plate and projecting axially beyond the exposed surface portion associated with the opening in said top plate receiving said mold; and

c. means communicating with the interior of said enclosure for maintaining a cooling fluid in said housing in thermal contact with the outer surface of said molds which is within said enclosure.

3,982,721

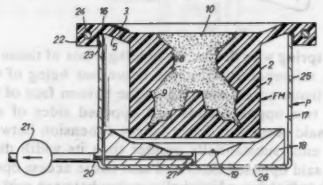
MOLDING APPARATUS INCLUDING A ONE-PIECE FLEXIBLE MOLD DEFORMABLE BY FLUID PRESSURE DIFFERENTIAL

William J. Maurino, and Raymond M. Putzer, both of Racine, Wis., assignors to Precision Flexmold, Inc., Racine, Wis.

Filed Jan. 20, 1975, Ser. No. 542,178

Int. Cl.² B29C *1/16, 1/12;* **B28B** *7/06*

U.S. Cl. 249—139 **11 Claims**



1. Apparatus for molding seamless articles comprising, a generally hollow one-piece distensible mold of elastomeric material and having a self-supporting, radially extending annular flange, a vacuum pot having a side wall with an upper edge and being of such size so as to receive said mold therein with said flange resting on said pot edge to form a seal therewith, said mold and pot thus forming an annular chamber therebetween, means for drawing a vacuum on said chamber whereby said mold distends and expands into said chamber to release the molded article from the mold and said flange cooperates with said pot edge to maintain said seal as said mold is retracted from an article therein, said flange having a downwardly extending projection around its periphery freely slidable over said pot wall whereby said flange may be easily set on and removed from the pot and whereby said downwardly extending projection also radially centers said mold in said pot, said flange including a restraining ring member imbedded in its periphery to restrict inwardly radial movement of said periphery, and when vacuum is applied, said projection prevents said flange from being drawn completely into said pot.

3,982,722

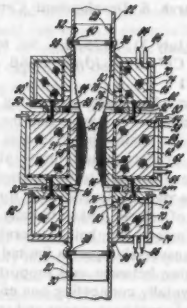
MAGNETIC CONTROL VALVE

James A. Bernard, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 21, 1975, Ser. No. 634,160

Int. Cl.³ F16K *7/04*

U.S. Cl. 251—4 **3 Claims**



1. A valve for controlling fluid flow comprising: means forming an inlet and an outlet to direct fluid through the valve;

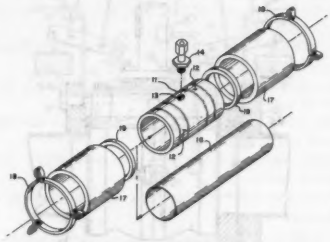
a radially flexible member having end portions attached to said inlet and outlet means, respectively, in a fluid-tight manner to cause fluid to flow through an intermediate portion of the tubular member; means having a substantially annular configuration encircling said intermediate portion of said flexible member and attached to said inlet and outlet means to limit outward expansion of said flexible member, thus forming a variable volume annular space therebetween; a plurality of relatively small particles partially filling said annular space capable of movement to end portions thereof to permit maximum outward expansion of said intermediate portion when the valve is in an open operative condition and alternately of movement to a central portion of said annular space encircling said intermediate portion of said flexible member when the valve is in a closed operative condition; means which may be selectively energized to cause movement of said particles, thereby producing an accumulation of particles encircling said intermediate portion and against the encircling housing means, thereby causing radial contraction of said flexible intermediate portion to decrease the flow area of the valve.

3,982,723

PINCH VALVE AND METHOD FOR FABRICATION

Freeman A. Ford, Atherton, and Richard O. Rhodes, San Francisco, both of Calif., assignors to Fafco Incorporated, Menlo Park, Calif.

Filed Mar. 28, 1974, Ser. No. 455,869
Int. Cl.² F16K 7/07; F16L 21/06
U.S. Cl. 251—5 **3 Claims**



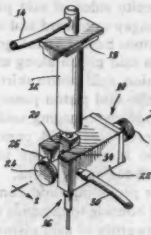
1. A valve assembly for placement between the ends of inlet and outlet conduit sections for controlling flow of a fluid therethrough, comprising a valve body having an inner and an outer surface defining a cylindrical wall, a flexible tube extending axially through and having a length longer than said valve body so that said flexible tube may be folded back over the ends of said valve body to overlie the outer surface of said cylindrical wall at the ends thereof, a valve end tube for surrounding said flexible tube where it overlies the outer surface on each end of said valve body, and an expansion clamp surrounding said valve end tube at each end of said valve body for applying inwardly directed radial pressure on said valve end tube when tightened, said valve end tube being deformable and adapted to surround the ends of the inlet and outlet conduit sections so that when radial pressure is applied inwardly on said valve end tube a seal is formed between said valve body and said flexible tube, and the axial spacing of the clamps relative to the ends of the inlet and outlet conduit sections surrounded by said valve end tube being such that upon said expansion clamps being further tightened, the ends of the conduit sections are secured therein spaced apart by at least the length of said valve body, said flexible tube and the inner surface of said valve body cooperating to form a sealed valve chamber therebetween, said valve body having an opening through said cylindrical wall for admitting pressure into said sealed valve chamber, whereby pressure directed through said opening meters the fluid flow from full flow to substantially zero flow as pressure rises and said flexible tube distends into and blocks flow through said valve body.

3,982,724

DEFORMABLE TUBE MATERIAL DISPENSER

Paul S. Citrin, Danbury, Conn., assignor to Indicon Inc., Danbury, Conn.

Filed Apr. 14, 1975, Ser. No. 568,123
Int. Cl.² F16K 7/06
U.S. Cl. 251—7 **11 Claims**



1. A material dispenser for dispensing flowable materials comprising

a valve housing having a movable pressure element for control of the flow of material;

a deformable tube valve assembly mounted to the valve housing, said deformable tube valve assembly having a deformable tube made of a material selected to enable repetetive tube constriction for control of the flow of material through the tube, said assembly further being provided with an opening sized to receive the pressure element and located to expose a pinch region of the deformable tube for constriction thereof, the valve assembly being selectively shaped to support the deformable tube in the vicinity of the pinch region to enable precise control of constriction of the tube by the pressure element active on the exposed pinch region of the tube;

means for internally supporting the tube on the downstream side of the opening to render said tube effectively nondeformable on the downstream side of the pinch region; and

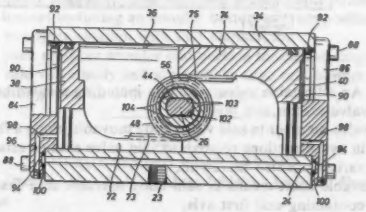
a micrometer operatively located on the valve housing to contact the pressure element to limit movement thereof for control of the size of the opening of the tube at the exposed tube pinch region for corresponding control of the flow of material.

3,982,725

VALVE ACTUATOR

Malcolm D. Clark, Glascow, Scotland, assignor to Keystone International, Inc., Houston, Tex.

Filed June 27, 1974, Ser. No. 483,667
Int. Cl.² F01B 9/04; F16K 31/163
U.S. Cl. 251—14 **14 Claims**



13. A fluid powered actuator comprising:

a housing having a cylindrical piston passageway therethrough and a shaft bore therein, said shaft bore being transverse to and intersecting said piston passageway;

a shaft rotatably mounted in said shaft bore and extending through said piston passageway, said shaft having a longitudinal rod receiving bore extending into at least one end of said shaft, and said rod receiving bore having wrench surfaces therein;

a pinion fixedly attached to said shaft within said piston passageway;

a pair of pistons tightly disposed in said piston passageway on axially opposite sides of said pinion and movable in said piston passageway toward and away from said pinion, each of said pistons having an integral piston skirt extending axially from said piston along said piston passageway toward said pinion, said piston skirts being radially opposite each other in said piston passageway, each having a gear rack operatively engaging said pinion;

first means for providing fluid communication from the exterior of said housing to the interior of said piston passageway between said pistons;

second means for providing fluid communication from the exterior of said housing to the ends of said piston passageway axially outwardly of said pistons;

and manual override means operatively connected to said shaft for manually rotating said shaft, said manual override means including a rod slidably disposed in said rod receiving bore and having wrench surfaces engageable with the wrench surfaces of said bore to prevent relative rotation between said shaft and said rod, said manual override means further including withdrawing means for withdrawing said rod at least partially out of said bore whereby said rod can be gripped and rotated thereby rotating said shaft.

3,982,726

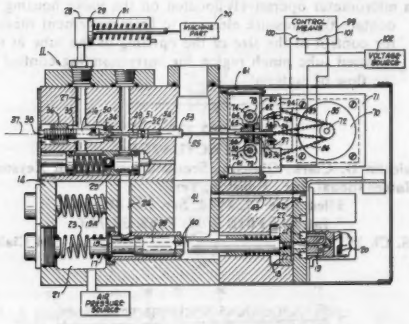
ADJUSTABLE VALVE ASSEMBLY

Arthur T. Bublitz, Saline, Mich., and Eugene F. Holben, Haddonfield, N.J., assignors to Reliance Electric Company, Cleveland, Ohio

Filed Aug. 6, 1975, Ser. No. 602,245

Int. Cl.² F16K *31/04*

U.S. Cl. 251—133 **12 Claims**



1. An adjustable valve assembly including a valve body,

a valve seat in said body,

a valve member in said valve body movable along a first axis in two directions relative to said valve seat to establish a variable orifice therewith,

movable shaft means in said body movable in a first plane containing said first axis,

means interconnecting said movable shaft means and said valve member for concurrent movement,

a motor

line shaft means connected to be driven by said motor and journalled for rotation about a second axis in a second plane substantially normal to said first axis,

first and second drive trains from said line shaft means to said movable shaft means,

first and second clutch means in said first and second drive trains, respectively,

actuator means having a neutral position intermediate first and second actuated positions along first and second different paths, respectively, and connected to actuate said first and second clutch means, respectively,

control means connected to control said actuator means and having first and second conditions and a third neutral condition of non-actuation of said actuator means,

and said first and second conditions of said control means connected to control said actuator means for movement along said first and second paths, respectively, to actuate said first and second clutch means, respectively, for opening and closing movements, respectively, of said valve member.

3,982,727

FLANGELESS VALVE

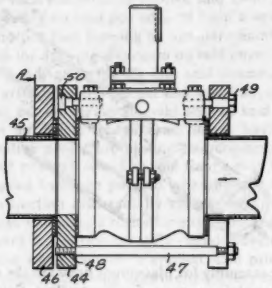
Juha Antti E. Nelimarkka, Helsinki, Finland, assignor to Neles Oy, Finland

Continuation of Ser. No. 350,490, April 12, 1973, abandoned. This application Dec. 27, 1974, Ser. No. 536,990

Claims priority, application Finland, Apr. 12, 1972, 1036/72

Int. Cl.² F16L *29/00*

U.S. Cl. 251—152 **2 Claims**



1. For securement betwen two, axially spaced pipe flanges, each of which has a ring of a plurality of angularly spaced bolt holes proceeding axially therethrough, with these bolt holes on one flange being in axial alignment with corresponding ones of these bolt holes on the other flange so that respective long bolts could be installed and secured between each respective pair of axially aligned bolt holes on the two flanges and tightened to draw the two flanges axially towards one another, the spaced occupied by such bolts between the flanges thus defining a plurality of mutually parallel long bolt paths:

a flangeless rotary valve having a body with an inlet and outlet at axially opposite ends thereof on respective upstream and downstream sealed together, halves of said body and with a valve actuator shaft projecting radially outwardly from the body intermediate these ends;

the body having an exterior size and shape of such small diameter that, upon being axially aligned and centered between said flanges, all but a minority of said long bolt paths will remain unoccupied by the valve and that said minority which is obstructed is located angularly adjacent where the valve actuator shaft projects from the body;

the body further including: means defining a radially outwardly facing support surface on said body halves, ringing said shaft; a ring shaped frame supported upon the sup-

port surface; fastener means removably securing said frame in place upon said support surface;

for at least one said obstructed long bolt path, a pair of openings through said frame, each such pair of openings being in axial alignment with one another on a respective one said obstructed long bolt path,

whereby, when the valve is installed between said pipe flanges, long bolts may be installed and tightened between said pipe flanges along the unobstructed long bolt paths, and short bolts may be installed and tightened between the respective frame openings and flange openings on said at least one obstructed long bolt path.

3,982,728

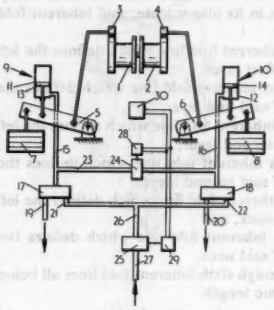
BRAKING APPARATUS FOR HOISTS

Bernard Elliott Shaw, Paisley, Scotland, assignor to Fullerton, Hodgart & Barclay Limited, Scotland

Filed June 10, 1974, Ser. No. 478,103

Int. Cl.² B66D *1/26*

U.S. Cl. 254—184 **4 Claims**



1. In a braking mechanism for a hoist incorporating two interconnected drums, two hoisting cables wound around said drums, a brake system incorporating a brake for each drum and biasing means urging the brakes to move to the brakes applied states and fluid pressure thruster means operable in opposition to the biasing means to move the brakes to the off state, first and second two-way brake control valves for respective thruster means each of said valves having a fluid receiving branch and two alternately selectable outlet branches, and a fluid supply line for each thruster means connected between the associated thruster means and outlet branch of the associated two-way brake control valve, said valve being operable to connect the associated fluid supply line alternatively to the other outlet branch which constitutes an exhaust branch or to the fluid-receiving branch, the improvement comprising a bridge pipe interconnecting the fluid supply lines leading to the two fluid pressure thruster means at points in said fluid supply lines between said two-way valves and said thruster means, a stop valve located in the bridge pipe and isolator stop valve means the outlet of which is connected to the fluid-receiving branches of the two-way brake control valves and the inlet of which is connectible to a source of supply of operating fluid under pressure.

3,982,729

BACK-UP SEAL FOR DIAPHRAGM VALVE

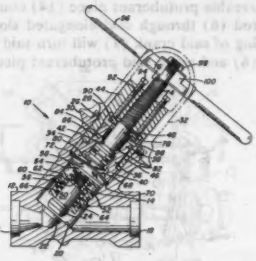
John D. Tricini, Greensburg, Pa., assignor to Kerotest Manufacturing Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 451,143, March 14, 1974, which is a continuation of Ser. No. 349,768, April 10, 1973, abandoned.

This application Nov. 18, 1974, Ser. No. 524,821

Int. Cl.² F16K *31/44*

U.S. Cl. 251—214 **9 Claims**



1. A diaphragm valve comprising,

a valve body having a chamber therein with an upper portion and a lower portion, said lower portion having inlet and outlet openings communicating with said chamber lower portion,

a valve seat in said chamber lower portion between said inlet and outlet openings,

a valve member positioned in said chamber lower portion in overlying relation with said valve seat and arranged to control the flow of fluid through said chamber lower portion,

a flexible diaphragm positioned in said chamber in overlying relation with said valve member and arranged to seal said chamber lower portion from said chamber upper portion,

a bonnet positioned in said chamber upper portion in overlying abutting relation with said diaphragm, said bonnet having a passageway therethrough,

a valve stem positioned in said bonnet passageway with a lower end abutting the top surface of said diaphragm,

sealing means positioned in said bonnet passageway and surrounding said valve stem extending through said bonnet passageway,

said sealing means operable to permit axial movement of said valve stem in said bonnet passageway and seal said bonnet passageway to prevent the flow of fluid upwardly therethrough,

means to move said valve stem in said bonnet passageway to thereby transmit movement through said diaphragm to said valve member, a yoke member including a lower annular end portion,

said bonnet includes an outer annular shoulder portion abutting said yoke member lower annular end portion,

said bonnet including an annular bottom portion positioned in overlying relation with said diaphragm,

said yoke member annular end portion threadably engaged to said valve body and arranged to urge said bonnet into abutting relation with said diaphragm.

3,982,730

STRUT SPRING COMPRESSOR

Misao Otsuka, No. 8146-2 Oaza-Ishioka, Ishioka, Ibaragi, Japan

Filed June 10, 1975, Ser. No. 585,752

Claims priority, application Japan, June 11, 1974, 49-67821

Int. Cl.² B23P *19/04*

U.S. Cl. 254—10.5 **1 Claim**

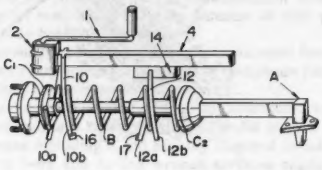
1. A strut spring compressor for compressing a spring in a strut assembly which spring comprises an elongated straight

element having first and second spring seats (C_1, C_2) separated from each other with the spring coiled around straight element and held between said seats, said strut spring compressor comprising:

a. an elongated hollow straight rod receiving member (4) with an elongated slot (5) therein with a base housing body (2) supporting a crank (1) with a gear drive (3) in said base housing body (2);

b. a threaded turning rod (6) in said receiving member (4) with a driver gear (9) engaging said drive gear (3);

c. a moveable protuberant piece (14) coupled to said turning rod (6) through said elongated slot (5) so that the turning of said crank (1) will turn said threaded turning rod (6) and move said protuberant piece; and,



d. fixed and moveable spring compression plates (10, 12), said fixed plate (10) extending from the region of said base housing body (2) outwards from said slot (5), said moveable plate (12) extending from said moveable protuberant piece (14), said plates being substantially the same size each having a central open portion (11, 15) to encircle a spring to be compressed, said open section being defined by threadlike claws (10*a*, 10*b*, 12*a*, 12*b*), the pitch of said claws corresponding approximately to the coil of the spring with engaging pieces to engage the spring to be compressed at the tips of opposing surfaces of said claws.

3,982,731

FLUID PRESSURE ROLLER JACK

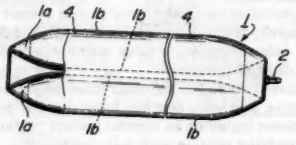
Toshiyata Tezuka, Yokohama, Japan, assignor to Bridgestone Tire Company Limited, Tokyo, Japan

Continuation of Ser. No. 381,198, July 20, 1973, abandoned. This application Mar. 31, 1975, Ser. No. 563,899

Claims priority, application Japan, July 24, 1972, 47-73931

Int. Cl.² B66F *3/24*

U.S. Cl. 254—93 HP **2 Claims**



1. A fluid pressure roller jack comprising a fluid-tight wall, said roller jack being:

a. inflatable for use into a state in which said wall is generally circular in cross-section perpendicular to a principal, or cylinder, axis and the radius of the circular cross-section is approximately constant over substantially the entire length of said roller jack and

b. collapsible for storage into a layered but generally planar state, said roller jack when collapsed for storage comprising:

c. a first layer

i. which is hollow,

ii. which is generally rectangular in planar view, but has rounded corners,

iii. which is generally rectangular in cross-section, and

iv. the hollow interior of which communicates with the hollow interior of an axial neck to be recited along the axial length of one side thereof;

d. a second layer

i. which is hollow,

ii. which is generally rectangular in planar view, but has rounded corners,

iii. which is generally rectangular in cross-section,

iv. which is substantially the same size as said first layer, and

v. the hollow interior of which communicates with the hollow interior of said axial neck along the axial length of one side thereof; and

e. an axial neck comprising two portions of said wall

i. which are generally perpendicular to said first and second layers,

ii. which are generally parallel to said principal axis,

iii. the height of which perpendicular to said first and second layers is very small relative to the width of said first and second layers, and

iv. which together define a hollow interior which communicates with the hollow interiors of said first and second layers,

said wall having inherent fold lines along which it invariably folds in a predetermined manner perpendicular to said principal axis when being collapsed, said inherent fold lines defining portions of said wall which are folded inwardly when said roller jack is in its planar state, said inherent fold lines comprising:

f. a first inherent fold line which defines the left-hand edge of said first layer,

g. a second inherent fold line which defines the right-hand edge of said first layer,

h. a third inherent fold line which defines the left-hand edge of said second layer,

i. a fourth inherent fold line which defines the right-hand edge of said second layer,

j. a fifth inherent fold line which defines the left-hand edge of said neck, and

k. a sixth inherent fold line which defines the right-hand edge of said neck,

said first through sixth inherent fold lines all being of substantially the same length.

3,982,732

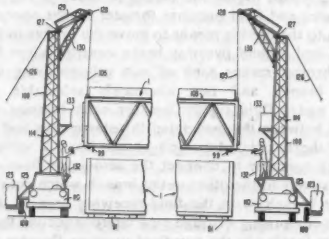
APPARATUS FOR TRANSPORTING AND ERECTING MODULAR HOUSING SYSTEM

David R. Pender, 1018 Marion St., Columbia, S.C. 29201

Division of Ser. No. 395,517, Sept. 10, 1973, Pat. No. 3,881,283. This application Oct. 9, 1974, Ser. No. 513,215

Int. Cl.² B66C *23/00*

U.S. Cl. 254—139.1 **7 Claims**



1. Apparatus for use in constructing plural level dwellings formed from a plurality of prefabricated basically L-shaped modules each having a single vertical wall and a bottom horizontal wall, said apparatus comprising twin wheel mounted construction cranes having relatively short fixed angle booms

projecting from corresponding sides of the cranes, wheeled counterweighting means detachably coupled with the sides of the frames remote from their booms, winch operated lifting cables for said cranes trained over the outward ends of said booms, said twin cranes arranged for parallel traversing near opposite ends of a housing module, and a lifting truss connected with said cables of the crane and adapted to be temporarily attached to a housing module at the side thereof remote from the module vertical wall and thereby forming with that module a rigid structure capable of withstanding stresses caused by lifting, transporting and placement of the module by said twin cranes, said lifting truss comprising a main longitudinal truss section which is substantially coextensive lengthwise with the module being lifted and a pair of hinged end transverse truss sections on the longitudinal truss section adapted to span opposite ends of the housing module and be coupled thereto.

3,982,733

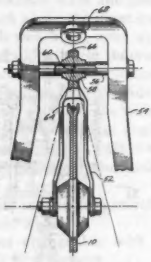
GIMBALED SHEAVE WITH CABLE ANGLE SENSORS

Myrl E. Orme, Canoga Park, Calif., assignor to The Bendix Corporation, North Hollywood, Calif.

Division of Ser. No. 400,478, Sept. 24, 1973, Pat. No. 3,902,701. This application Jan. 8, 1975, Ser. No. 539,556

Int. Cl.[2] B66D *1/36*

U.S. Cl. 254—173 R **3 Claims**



1. In combination a cable-directing sheave and support therefor comprising:

a frame and a first support member in said frame including means permitting said sheave to rotate in its own plane,

a second support means carried on said first support member including means permitting said sheave to rotate in a second plane perpendicular to said first named plane and a third plane perpendicular to both said first named and second planes, said second support means comprising a fork member carrying said sheave, a monoball on said first support member and a mating surface on said second support means for receiving said monoball, said sheave being positioned in said fork member such that the axes of rotation of said means permitting rotation in said second or third planes are in substantial alignment with a cable on said sleeve, and

photoelectric means installed on said frame and on said mating surface of said second support means for generating electrical signals representative of the departure of said sheave from a null position.

3,982,734

IMPACT BARRIER AND RESTRAINT

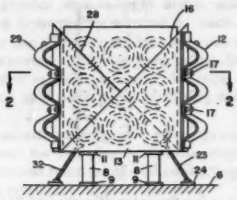
Grant W. Walker, Sacramento, Calif., assignor to Dynamics Research and Manufacturing, Inc., Sacramento, Calif.

Filed June 30, 1975, Ser. No. 591,277

Int. Cl.[2] A01K *3/00*

U.S. Cl. 256—13.1 **7 Claims**

1. An impact barrier and restraint for use on a longitudinally extending roadway comprising means forming a plurality of pairs of bases, each pair being disposed transversely of said roadway and one pair being disposed behind the other, a first pair of transversely extending longitudinally spaced support plates, each support plate upstanding from a transverse pair of said base forming means, a first lateral buffer beam extending longitudinally of said roadway, means for stationarily fastening said first buffer beam to longitudinally spaced successive ones of said support plates, a second lateral buffer beam



extending longitudinally of said roadway, means for stationarily fastening said second buffer beam to a second pair of longitudinally spaced successive ones of said support plates, means secured to said roadway for restraining transverse movement of said support plates on said base forming means, and energy absorbing means resting on said base forming means and disposed adjacent to said buffer beams and between successive support plates.

3,982,735

DISMANTABLE AND DIRECTABLE RAIL OR BALUSTRADE

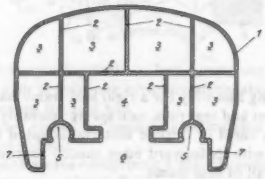
Gilbert P. Fornells, 38 rue Stendhal, 75020 Paris, France

Filed Nov. 21, 1973, Ser. No. 418,013

Claims priority, application France, Nov. 23, 1972, 72.41593

Int. Cl.[2] E04H *17/14*

U.S. Cl. 256—59 **10 Claims**



1. A dismantable elongated rail assembly comprising a rail for attachment to a series of supporting elements spaced from each other,

mounting means secured to each of said elements,

a rail extending between said elements each having first and second ends,

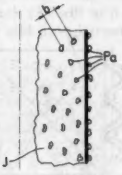
interengaging means on said mounting means and said rail for securing successive rails to said mounting means, said interengaging means comprising at least a pair of spaced projections on said mounting means, spaced grooves in said rail for mating with said projections and said projections being snapfitted into said grooves.

3,982,736

INTENSIFICATION OF FLUID-FLUID TRANSPORT PROCESSES

Lajos Mészaros, Szeged; József Grega, Miskolc; Lajos Lako, Miskolc; László Marko, Miskolc; Zoltán Salamon; István Szatmari, both of Sajobabony, and Laszlo Tasi, Miskolc, all of Hungary, assignors to Eszakmagyarorszagi Vegyimuvek, Sajobabony, Hungary

Filed May 20, 1974, Ser. No. 471,821
Int. Cl.² B01F 7/20
U.S. Cl. 259—107 3 Claims



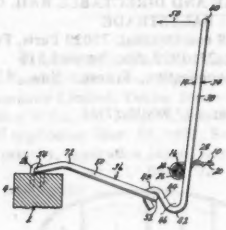
1. An agitator for the intensification of fluid-fluid transport processes, comprising a rotor having thereon a multiplicity of filamentary elements, the elements having a thickness-to-length ratio of 1:5 to 1:5000 and a thickness of 10–5000 μm, there being several thousand said elements on the rotor.

3,982,737

SPRING ASSEMBLY FOR UPHOLSTERED SEATS

John G. Platt; Harmon W. Arnold; Lloyd E. Tieman, all of Carthage, and Robert O. Isaacs, Joplin, all of Mo., assignors to Flex-O-Lators, Inc., Carthage, Mo.

Filed Apr. 9, 1975, Ser. No. 566,214
Int. Cl.² F16F 3/00
U.S. Cl. 267—102 17 Claims



1. A spring assembly for a rigid seat frame having generally parallel front and rear rails, said spring assembly comprising:

a. a deck sheet of flexible material adapted to overlie said frame with its forward edge spaced rearwardly from the front rail of said frame,

b. rearward attaching means operable to secure the rearward edge of said deck sheet to the rear rail of said frame,

c. a series of vertically angled, substantially rigid levers spaced across the forward edge of said deck sheet, each being pivoted vertically, at its angle, to the forward edge of said deck sheet, and including an upwardly and forwardly inclined upper leg extending to a point spaced upwardly from said front frame rail, and a lower leg extending forwardly and downwardly from the pivot of said lever, said upper legs forming a bolster support portion of the assembly, said legs both being vertically inclined relative to the normal plane of said deck sheet,

d. a link pivoted vertically to the free end of each of said lower lever legs, and extending forwardly therefrom,

e. forward attaching means operable to connect the forward end of each of said links to said front frame rail for vertical pivotal movement relative thereto, whereby said forward attaching means, said links, said lower lever legs, said deck sheet and said rearward attaching means form a continuous connection between said front and rear frame rails, and

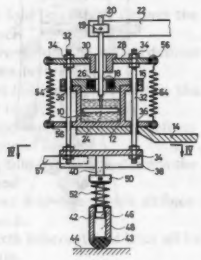
f. resilient tensioning means yieldable forwardly and rearwardly of said frame and interposed in said continuous connection as above defined, whereby said deck sheet is resiliently tensioned in its own plane, and whereby said levers are tensioned to cause upward pivoting thereof, whereby the bolster support formed by said upper lever legs is resiliently supported against downward deflection.

3,982,738

DASH-POT ARRANGEMENT FOR BALANCE

Eugen Meier, Meilen, and Milan Ellner, Uster, both of Switzerland, assignors to Mettler Instrumente AG, Griefensee-Zurich, Switzerland

Filed Apr. 14, 1975, Ser. No. 567,988
Claims priority, application Switzerland, Aug. 30, 1974, 11831/74
Int. Cl.² G01G 23/02, 21/10
U.S. Cl. 267—121 9 Claims



1. A dash-pot arrangement for a balance beam comprising:

a. a vessel enclosing a cavity and formed with an access opening to said cavity;

b. a body of liquid in said cavity;

c. a rod member received in said opening with sufficient clearance to permit free movement of the rod member in a direction inward and outward of said cavity;

d. a piston mounted on said rod member in said cavity, said piston dividing said cavity into two compartments and bounding a restricted throttling passage connecting said compartments;

e. an annular sealing member of resilient material mounted on said vessel adjacent said opening;

f. an annular engagement member of a material more rigid than said resilient material,

1. said rod member passing freely through said annular members in the relaxed condition of the member;

g. operating means for moving said engagement member toward and away from a position of engagement with said sealing member,

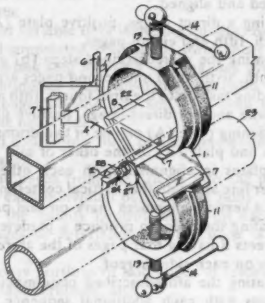
1. said engagement member when in said position of engagement resiliently deforming said sealing member sufficiently so that said sealing member seals said opening against flow of said liquid from said cavity; and

h. securing means for securing said rod member to said balance beam.

3,982,739
PORTABLE VISE

Roger V. Maes, 1223 S. Hutchins St., Lodi, Calif. 95240

Filed Aug. 1, 1975, Ser. No. 601,031
Int. Cl.² B25B 1/20
U.S. Cl. 269—37 11 Claims



1. A portable vise comprising

a pair of open wells each well being formed by inwardly converging, longitudinal walls and said open wells being united back to back along the inner ends of the converging walls and each well being open at both ends thereof to receive an object lengthwise therein,

a single open well formed by inwardly converging longitudinal walls and being open at both ends thereof,

means to connect said pair of wells with the single well so as to hold the single well at right angles to and opening away from the pair of united wells whereby said pair of wells form a horizontal support and said single well forms a vertical support of the vise,

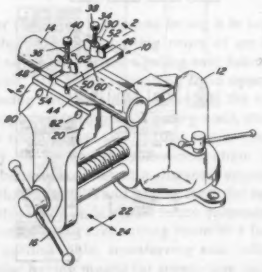
clamping means engageable with a selected well for clamping the work in said well,

and clamping means engageable with another well for clamping said well to a support.

3,982,740
CLAMPING DEVICE

David Gutman, 503 Reed St., Philadelphia, Pa. 19147

Continuation of Ser. No. 347,053, April 2, 1973, abandoned.
This application June 20, 1975, Ser. No. 588,982
Int. Cl.² B25B 5/16
U.S. Cl. 269—110 6 Claims



1. A clamping device for gripping a longitudinally disposed work piece comprising:

a. a vise having a pair of transversely displaceable vise jaws, each of said vise jaws having longitudinally extending upper and side surfaces, said upper and side surfaces being orthogonal each to the other for contacting said workpiece along an interface line of said upper and side surfaces;

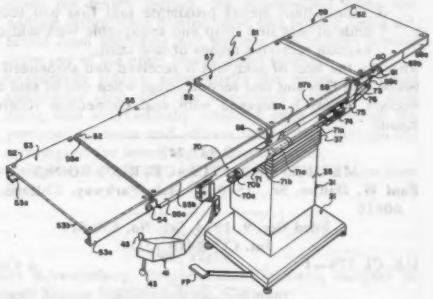
b. means for contacting said work piece in a downward direction between said vise jaws in transverse contact with said work piece, said contacting means being singularly planar in contour for contacting said work piece along only one line of contact, said vise jaws and said contacting means having load contact with said work piece along three lines of contact, said three lines of load contact forming three load point contacts in a plane normal to said longitudinally disposed work piece, said point load contacts between each of said displaceable vise jaws and said contacting means having an angular displacement greater than a right angle, said contacting means being removeably secured to each of said vise jaws, the portion of the work piece between said vise jaws being unsupported, said vise jaws being displaced each from the other in said transverse direction to provide a work area on said work piece opposing said contacting means; and,

c. transverse adjustment means formed through said contacting means for allowing transverse displacement of said vise jaws and removal of said contacting means from cooperative relation with said vise jaws.

3,982,741
OPERATING TABLE OR THE LIKE WITH GEOMETRICALLY COMPENSATED DIFFERENTIALLY MOVABLE LOAD SHARING MULTIPLE HYDRAULIC CYLINDER AND PISTON ARRANGEMENT

Larry D. Mitchell, Ballwin, and Murray Q. Tanner, III, Florissant, both of Mo., assignors to Affiliated Hospital Products, Inc., St. Louis, Mo.

Filed Mar. 25, 1975, Ser. No. 561,888
Int. Cl.² A61G 13/00
U.S. Cl. 269—325 13 Claims



1. A patient supporting table or bed comprising,

a table top with at least one pivotally articulatable section, support means for said top,

and movement means for imparting articulated movement to said one section,

said movement means comprising a pair of tandem tension-to-compression closed-fluid-interconnected laterally spaced parallel hydraulic actuating cylinders interconnected through a closed tension-to-compression fluid interconnection between the compression or piston end of one cylinder and the tension or rod end of the other said cylinder,

the ratio of the interconnecting cylinder cross-section area of the piston-end-interconnected one of said cylinders relative to the (cylinder area minus rod cross section) area of the other rod-end-interconnected said cylinder at the closed tension-to-compression fluid interconnection between the compression or piston end of said one cylinder and the tension or rod end of the other said cylinder being other than unity,

said cylinders being mounted and connected in pivotal-movement-imparting relation between said support and

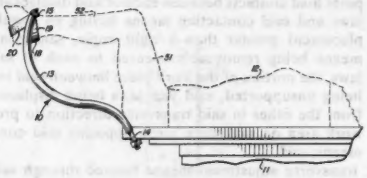
said one table top section through compensating geometrically sized linkage means in compensating differential geometrical size relation proportional to said ratio.

3,982,742

MEDICAL STIRRUPS

John L. Ford, 4651 E. Palomino Road, Phoenix, Ariz. 85018

Filed Nov. 17, 1975, Ser. No. 632,480
Int. Cl.² A61G 13/00
U.S. Cl. 269—328 5 Claims



1. A stirrup for use in combination with a medical table for engaging the foot of a patient and supporting the leg of the patient during certain medical procedures, said stirrup comprising:

a. an elongate shaft including,

i. a first end adapted to be secured to said medical table,

ii. a second end having connection receiving means; and

b. foot receiving means including,

i. a first elongate flexible strap having first and second ends,

ii. a second elongate flexible strap having first and second ends secured to said first strap and having a centerline generally arcuate relative the centerline of said first strap, and

iii. connection means proximate said first and second ends of said first strap and engageable with said connection receiving means of said shaft,

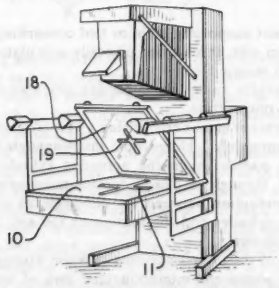
whereby the heel of said foot is received and suspended between said first and said second straps when one of said connection means is engaged with said connection receiving means.

3,982,743

METHOD OF MANUFACTURING BOOKS

Paul W. DeRoo, Sr., 1540 N. State Parkway, Chicago, Ill. 60610

Filed Dec. 9, 1974, Ser. No. 530,517
Int. Cl.² B41F 13/54
U.S. Cl. 270—1 6 Claims



1. A method of manufacturing bound books, comprising the steps of:

a. selecting a sequence of eight pages of a book or page proofs thereof,

b. taking the first, fourth, fifth and eighth of said pages and placing them in a work holder on the bed surface of a direct-image, positive plate-making machine wherein said work holder includes raised positioning means disposed perpendicular to and intersecting each other, said positioning means being effective to locate these four pages in a rectangle with the upper left corners of the first and fifth pages adjacent the center of the positioning means and the upper right corners of the fourth and eighth pages adjacent the center of said positioning means and also with the head and gutter margins of each page correctly spaced and aligned,

c. making a direct image, positive plate (A) of said first, fourth, fifth and eighth pages,

d. repeating the aforedescribed steps (b) and (c) with the seventh, sixth, third and second pages arranged in corresponding fashion to the first, fourth, fifth and eighth pages to make another direct-image, positive plate (B),

e. positioning plate (A) on one of two drums of a perfecting press and plate (B) on the other of said two drums with the plates in alignment with each other on a vertical center line and with that vertical centerline in registration with a vertical alignment mark on said press,

f. operating the press to produce a predetermined number of sheets S having four pages of the aforedescribed eight pages on each side thereof,

g. repeating the aforedescribed plate-making and printing process with each additional sequence of eight pages making up a book,

h. folding each sheet along one center line and then along the other perpendicular center line,

i. collating the folded sheets and assembling a book from sheets containing all of the pages of each book, and

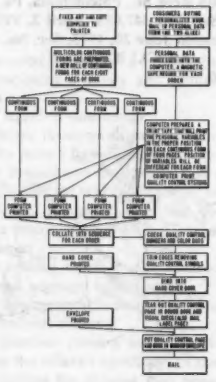
j. binding and trimming the assembled book.

3,982,744

PERSONALIZED COMPUTER PRINTED HARD COVERED BOOK

Joseph Stephen Kraynak, Van Nuys, Calif., and Arthur Blumenfield, Eastchester, N.Y., assignors to Me-Books Publishing Company, Burbank, Calif.

Continuation-in-part of Ser. No. 317,016, Dec. 20, 1972, Pat. No. 3,892,427. This application Mar. 10, 1975, Ser. No. 557,133
The portion of the term of this patent subsequent to July 1, 1992, has been disclaimed.
Int. Cl.² B41F 13/54
U.S. Cl. 270—12 1 Claim



1. The method of preparing a personalized hard cover story book having variable printed data of a personal nature and non-variable printed copy which utilizes a computer to print at least the personalized portions of the text comprising the steps of:

a. preprinting the pages of a book with non-variable copy and art materials on continuous form computer printing

sheet material to produce a preprinted continuous form computer printing sheet material;

b. inputting to a computer variable data for each personalized copy of the book;

c. introducing said preprinted continuous form sheet material into a computer printed in a manner such that a complete printed text will be produced for each set of variable data;

d. printing said variable data including quality control indicia on said preprinted continuous form sheet material, said pre-printing step and said printing step producing a printed continuous form sheet material with only odd numbered pages on one side and only even numbered pages on the other side;

e. cutting said continuous form printout materials to a size to form pages;

f. collating the pages from the printer into the proper sequence for each individual personalized book;

g. inspecting the quality control indicia on each of said collated pages to determine that the book is properly collated;

h. trimming away portions of said pages to remove quality control marks therefrom; and,

i. binding said pages into a hard cover book.

3,982,745

FABRIC SUPPLYING AND CUTTING SYSTEM

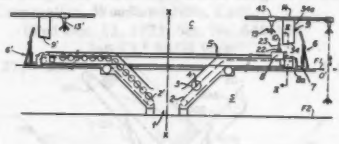
Bernard H. Weil, 13, Av. Foch, and Didier R. Weil, 3, Rue Jean de Bry, both of 25000 Besancon, France

Continuation-in-part of Ser. No. 513,854, Oct. 10, 1974, abandoned. This application Apr. 11, 1975, Ser. No. 567,105

Claims priority, application France, Oct. 11, 1973, 73.36352

Int. Cl.² B65H *29/46*

U.S. Cl. 270—31 **12 Claims**



1. A system for supplying fabric and laying it in superposed layers on a cutting table in a cutting room of an industrial fabricating plant which comprises winding said fabric on rigid tubes to form a roll, said tubes projecting from opposite ends of the rolls and being strong enough to support the rolls when said tubes are supported by their projecting ends, storing said rolls in a storage room below said cutting room, placing said rolls successively on an upwardly inclined chain conveyor comprising two belts spaced apart a distance approximately equal to the length of said rolls and having teeth for supporting said rolls by the projecting ends of said tubes, transporting said rolls by said conveyor up to said cutting room at a location at one end of said cutting table, transferring said rolls successively to an elevator having means for supporting said rolls by the projecting ends of said tubes, lifting one roll at a time by said elevator to a height above said cutting table, transferring said elevated roll to a carriage spanning said cutting table and running on rails at opposite sides of said cutting table, said carriage having bearing means for rotatably supporting said roll by the projecting ends of said tube, and moving said carriage along the cutting table while unwinding said roll to lay said fabric on the cutting table.

3,982,746

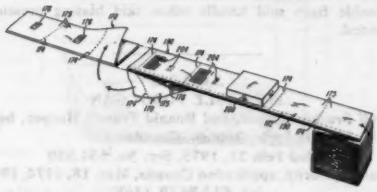
DIRECT MAIL ADVERTISING BOOKLET AND METHOD OF PRODUCTION

William J. O'Brien, Plandome Heights, N.Y., and John Sakal, Dayton, Ohio, assignors to The Standard Register Company, Dayton, Ohio

Division of Ser. No. 330,214, Feb. 7, 1973, Pat. No. 3,899,381. This application June 23, 1975, Ser. No. 589,713

Int. Cl.² B41L *43/12*

U.S. Cl. 270—37 **2 Claims**



1. The high speed method of producing personalized booklets for bulk mailing comprising:

superposing a plurality of individual continuous strips of paper-like material, there being a lowermost continuous strip and an uppermost continuous strip, each of the continuous strips having opposed longitudinal edges, the lowermost continuous strip having spaced-apart openings therein, at least one of the continuous strips having repetitive printed material thereupon,

attaching the continuous strips together along one longitudinal edge thereof to form a multiple ply web,

printing personalized name and address information upon the uppermost continuous strip at spaced-apart portions along the length thereof, the personalized name and address information printed upon one portion being different from the name and address information printed upon any of the other spaced-apart portions,

longitudinally folding substantially the entire lowermost continuous strip over the uppermost continuous strip along said longitudinally attached edge to expose the personalized name and address information through the openings in the lowermost continuous strip,

severing the multiple ply web along spaced-apart transverse lines.

3,982,747

SKI POLE

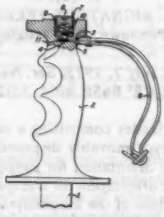
Hubert Schweinsberg, Bergneustadt, Germany, assignor to Joseph Stamm KG, Rebbelroth, Germany

Filed Apr. 11, 1975, Ser. No. 567,362

Claims priority, application Germany, Apr. 11, 1974, 2417959

Int. Cl.² A63C *11/22*

U.S. Cl. 280—11.37 H **7 Claims**



1. A ski pole comprising a handle and a hand strap releasably attached to said handle, said handle comprising longitudinal threaded bore means in the upper part thereof, threaded

element means adapted to be screwed and for adjustment in said bore means and comprising longitudinal recess means disposed in its underside adapted to receive and contain longitudinal, biasing resilient element means, ball means disposed at the end of said resilient means, slot means in said handle disposed laterally to and communicating with said bore means, said handstrap comprising release means adapted to engage said slot means, said release means comprising recess means adapted to have said ball means engaged therein at a predetermined biasing pressure to retain said release means in said slot means, whereby said release means and handstrap are releasable from said handle when said biasing pressure is exceeded.

3,982,748

FOLDABLE TOBOGGAN

Burrell Francis Hooper, and Ronald Francis Hooper, both of R.R. 1, Hyde Park, Ontario, Canada

Filed Feb. 21, 1975, Ser. No. 551,950
Claims priority, application Canada, Mar. 18, 1974, 195223
Int. Cl.² B62B *15/00*
U.S. Cl. 280—18 **9 Claims**

1. A foldable toboggan comprising adjacent forward and rearward sections connected together by duplex hinge means, said hinge means including a central plate having its front and rear edges each hinged to a respective front and rear hinge plate, each hinge plate holding one of said adjacent sections, said hinge plates being movable through at least 90° relative to the central plate whereby said sections can be folded into parallel relationship with the upper surfaces of said sections facing each other and with said central plate providing spacing between said folded sections, said hinge means including movement limiting means which prevent the forward edge of the base of said rearward section moving substantially below the plane of the base of the forward section, said movement limiting means including an extension of the forward hinge plate extending into a recess in said central plate and forming a stop member, which member cooperates with a downwardly facing surface movable with said central plate to prevent movement of the lower surface of said central plate below the plane of the base of said forward section, said duplex hinge means being arranged with hinge knuckles projecting upwards in the operative condition of the toboggan, and wherein, with the bases of the said adjacent sections coplanar, the lower surfaces of the central and hinge plates of the hinge means lie in the same plane as said bases to provide a substantially smooth undersurface joining the bases of the adjacent sections.

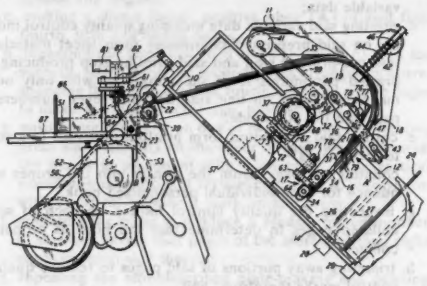
3,982,749

SIGNATURE FEEDER

Anton R. Stobb, Pittstown, N.J., assignor to Stobb, Inc., Clinton, N.J.

Filed July 7, 1975, Ser. No. 593,848
Int. Cl.² B65H *3/04, 5/02, 29/16*
U.S. Cl. 271—4 **7 Claims**

1. A signature feeder comprising a support frame, a stack-supporting conveyor movably disposed on said frame in an uprightly inclined orientation for supporting said stack in an uprightly inclined orientation for transporting a stack of signatures in the direction of the longitudinal axis of the stack and to a dispensing location, a signature pick-up conveyor movably supported on said frame and extending to said dispensing location and having a portion disposed in contact with the face of the stack at the forward end of the stack, said portion including a conveyor belt movable across the forward face of said stack for disposing the signatures in an imbricated stream of signatures, a guide member fixedly disposed on said frame adjacent said conveyor belt for receiving the imbricated stream of signatures and extending to a deposit location location where the signatures are passed beyond the control of said guide member, and an adjustable support disposed adjacent the forward face of the stack and with said conveyor belt



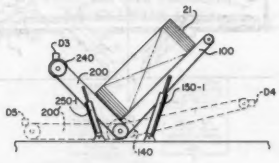
being trained on said support, said support including adjustable members adjustably positionable along the forward face of the stack to adjustably position said conveyor belt for engaging said sheets at a selected position on said sheet for establishing the amount of imbrication between consecutive ones of said sheets.

3,982,750

METHOD FOR TRANSPORTING AND REORIENTING A STACK OF MATERIALS

William F. Pulda, Piscataway, N.J., assignor to Vanguard Machinery Corporation, Edison, N.J.

Filed Jan. 29, 1975, Ser. No. 545,038
Int. Cl.² B65H *1/22*
U.S. Cl. 271—151 **12 Claims**



1. The method of transporting and reorienting a stack of materials, which comprises the steps of:

a. conveying the stack to a prescribed position on one driven feed conveyor;

b. pivoting another driven feed conveyor to a prescribed angular position relative to the one conveyor;

c. pivoting said one conveyor and upsetting said stack against the other conveyor; and

d. returning one of the conveyors to a prescribed position for the feed of the upset stack therefrom.

3,982,751

PARALLEL ACTION JOGGER

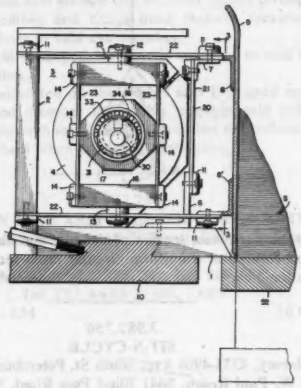
David Noel Obenshain, Swanton, Md., assignor to Westvaco Corporation, New York, N.Y.

Filed Sept. 16, 1975, Ser. No. 611,813
Int. Cl.² B65H *31/38*
U.S. Cl. 271—221 **11 Claims**

1. A sheet jogging device for precisely aligning cut sheets of material in a stack comprising:

a. a supporting means for a jogger device comprising a base member and back plate connected to one another;

b. a jogger paddle element attached to said supporting means by a first flexible spring device connected between said jogger paddle and said back plate and a second



flexible spring device connected between said jogger paddle and said base member; and,

c. a drive means mounted on said supporting means and connected to said first flexible spring device for actuating said jogger paddle element.

3,982,752

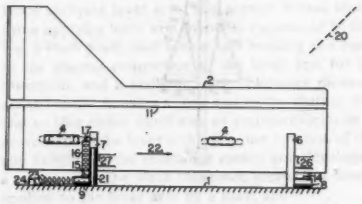
DOCUMENT GUIDE

Forrest L. Langford, Northridge, Calif., assignor to Terminal Data Corporation, Woodland Hills, Calif.

Filed Dec. 12, 1975, Ser. No. 640,320

Int. Cl.² B65H 9/16

U.S. Cl. 271—248 **9 Claims**



1. A document guide, comprising:

a. a plate (2) forming a surface of a guide for the transport of documents,

b. a support (7) attached to said plate and extending away from the surface of said plate,

c. a foot member (9) upon said support,

d. a base (1),

e. a first member (15) upon said base to allow rotation of said foot member, support, and plate with respect to said base,

f. first resilient means (16) attached to said support and to said base to urge a fixed rotational relation between said plate and said base, and

g. second resilient means (23) orthogonally attached to said support and to said base to urge a fixed translational relation between said plate and said base.

3,982,753

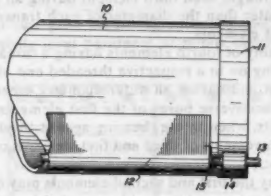
COMBINED BACKSTOP AND BRAKE

John F. Coleman, Rochester; Donald P. Miller, Webster, and John F. Hatzmann, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 12, 1973, Ser. No. 340,155

Int. Cl.² B65H 5/02

U.S. Cl. 271—275 **1 Claim**



1. In a facsimile transceiver including a rotating drum for conveying sheet material past a scanning station, said drum including a thumbwheel of resilient material mounted around said drum at one end thereof, said transceiver further including a wiper mounted on a shaft parallel to the axis of rotation of said drum, said wiper being disposed relative to said drum so as to maintain said sheet material in close proximity to said drum, an improved backstop and brake comprising

a tapered arm pivotably mounted on said shaft opposite said thumbwheel, and

a torsion spring mounted on said shaft between said wiper and said arm, said spring having a first tang in contact with said wiper and a second tang in contact with said arm so as to pivot said arm into contact with said thumbwheel,

said arm being arranged on said shaft and cooperating with said spring so as to apply a braking force on said drum when said drum rotates in a first direction and to depress said resilient thumbwheel when said drum rotates in a second direction to prevent rotation in said second direction.

3,982,754

APPARATUS FOR CONSTRUCTING STRUCTURES, PARTICULARLY FOR CHILDREN'S PLAYGROUNDS AND GARDENS

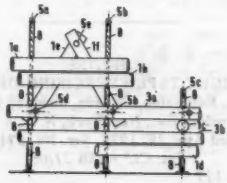
Guy de Moreau, Vuurgatstraat 46, 1900 Overijse, Belgium

Filed May 23, 1975, Ser. No. 580,358

Claims priority, application Belgium, May 27, 1974, 815567

Int. Cl.² A63B 17/00

U.S. Cl. 272—113 **7 Claims**



1. For use in assemblying structure for children's playgrounds, gardens and the like, the combination comprising,

a. a plurality of first elements of substantially equal cross section, each first element consisting of a log of undressed timber each having a pair of transverse bores disposed in a common plane passing longitudinally of the respective log, said bores being spaced on each first element a same predetermined modular distance and each having a same predetermined modular diameter,

b. a plurality of second elements each consisting of a bar having threaded opposite ends and each having a diameter less than the diameter of the bores of the first elements for being received in use in a corresponding bore of the first elements extending therethrough,

c. a plurality of tubular third elements of various equal lengths each having an axial through bore having a diameter greater than the diameter of said second elements for receiving in use the second elements extending axially therethrough, each third element having an outer diameter greater than the diameter of each transverse bore of the first elements,

d. a plurality of fourth elements having a threaded bore for threading on to a respective threaded end of said second element and having an outer diameter greater than that of the transverse bores of the first elements, said fourth elements, when in use, bearing against third elements to limit movements of third and first elements on the second elements,

e. whereby the first and second elements may be assembled in use in an assemblage with second elements upstanding extending through transverse bores of first elements so that said first elements span the distance between the second elements, said third elements are assembled in use axially spaced on the second elements intermediate at least some next adjacent first elements for spacing first elements axially on the second elements, and the fourth elements may be assembled threaded on outermost ends of the second elements, said first elements on said second elements being positionable to extend in radial directions from the second elements, and at least one of the second elements being positionable to extend axially through aligned transverse bores of all the first elements.

6. A structure for children's playgrounds, gardens and the like comprising, in combination, a plurality of first elements of substantially equal cross section and equal length, each first element consisting of a log of undressed timber each having a pair of parallel transverse bores extending through the longitudinal axis of said first element and spaced axially equally in each of the first elements, a plurality of spaced apart upstanding rod-like second elements extending axially through aligned transverse bores of the first elements, third elements maintaining spaces between the first elements on the second elements, said second elements each having opposite threaded ends, some of the first elements extending radially from the second elements in corresponding directions, others of said first elements being disposed and displaced vertically from said some of said first elements and generally extending in other radial directions, at least one of the second elements extending axially through aligned transverse bores of all of the first element, and threaded stop elements on said threaded ends of said second elements to limit movements of first and third elements axially on said second elements.

3,982,755

WEIGHT TYPE EXERCISING DEVICE

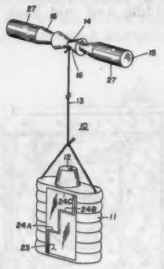
John I. Sarich, Edmonton, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Apr. 28, 1975, Ser. No. 571,965

Int. Cl.² A63B *21/06*

U.S. Cl. 272—117 **1 Claim**

1. A device for exercising purposes.comprising a cylindrical rod, two inverted tapered generally cone shaped sections joined together at their narrowest sections generally in the middle of the rod, a hollow transparent container having weight indicated indicia, said container being fixed to a flexible cord, the end of which is fastened to the narrowest section of the cylindrical rod, said container being adaptable to filling with an amount of water to achieve a desired weight, said device employed by rotation of the rod, when grasped in the hands of a user, so as to raise or lower the container as the cord is wound or unwound about the rod, the middle portion of the rod being of lesser diameter than the end sections of the rod so as to direct a wound cord



to the narrowest section of the rod, and each end of the rod formed of a uniform circular cross-section, to serve as handles.

3,982,756

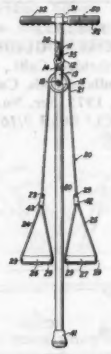
SIT-N-CYCLE

Carl Hersey, 4333-49th Ave. South St. Petersburg, Fla. 33711, and W. Paul Resop, 8041 Blind Pass Road, St. Petersburg Beach, Fla. 33706

Filed Apr. 28, 1975, Ser. No. 572,678

Int. Cl.² A63B *21/00*

U.S. Cl. 272—126 **1 Claim**



1. An exercising device comprising,

a staff made of rigid elongated material and a handle fixed to said staff,

a first eye fixed to said staff member and extending therefrom,

a second eye interlinked with the first eye, the second eye interconnected with said first eye having an elongated portion attached to a U-shaped member,

the U-shaped member having an intermediate part and spaced legs,

a wheel having an outer peripheral groove received between said legs,

an axle passing through said wheel and said legs,

a cord having a bite portion passing around said wheel,

two end portions, said end portions of said cord being folded back on themselves and attached thereto forming loops,

foot rest members supported in said loops,

said first eye member fixed to said staff member adjacent said handle and said first eye member has an elongated threaded part passing through a hole in said staff member and a nut on each side of staff member clamping said first eye member to said staff,

said U-shaped member has a nylon member received therein and said second eye member passes through said nylon member and has a head thereon received in a counter bore in said eye member,

whereby said U-shaped member is swiveled to said second eye member,

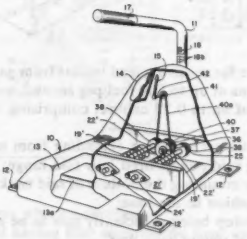
a yoke is supported on the side of said U-shaped member, a threaded member threadably engages said yoke and extends through said U-shaped member to produce a drag on the wheel when the wheel is rotating.

3,982,757

TORSION TYPE ARM EXERCISING APPARATUS

Richard J. McDonnell, 1004 Hillcrest Drive, DeSoto, Tex. 75115

Filed Apr. 17, 1975, Ser. No. 569,187
Int. Cl.² A63B *21/00, 23/00*
U.S. Cl. 272—134 **10 Claims**



1. An arm exercising apparatus including:

a. a housing, said housing being adapted to receive the elbow of the user;

b. torsion means for resisting the pivotal movement of a force applying lever arm, said torsion means including a force applying lever arm pivotally connected to the housing, a shaft positioned within said housing and connected to the pivotal connection of the lever arm for rotation therewith, and a resilient force resistance means rigidly affixed to the housing at one end to the shaft at the other end so that either clockwise or counterclockwise pivotal movement of the lever arm will cause rotation of the shaft and twisting of the resistance means and development of a resistance in the force resistance means to a force being applied to the lever arm by a user; and

c. a hand receiving means affixed to the end of said lever extending vertically away from said housing.

3,982,758

DUAL-USE TENNIS COURT PARKING LOT CONSTRUCTION METHODS AND APPARATUS

Charles L. Howes, Jr., 19 Covenant Lane, Georgetown, Conn. 06829

Filed Nov. 6, 1974, Ser. No. 521,516
Int. Cl.² A63B *61/00*
U.S. Cl. 273—29 R **11 Claims**

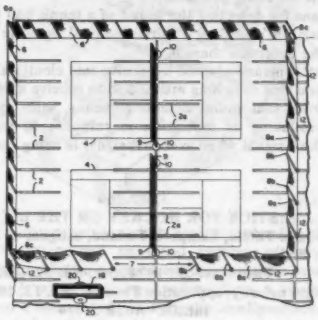
1. A dual-purpose paved parking lot-playing court assembly convertible between primary use as a parking lot and alternative primary playing court use as tennis courts, badminton courts, volleyball courts or the like comprising:

a. means forming a substantially level pavement graded for drainage and marked in a first color with parking indicia designating a plurality of side-by-side vehicle parking locations;

b. playing court border indicia positioned on the pavement and applied in a second color contrasting with the parking indicia's first color and with the pavement surface color for high visibility;

c. temporary fencing removably mountable on the pavement in an extended configuration forming a border around at least a portion of the playing court border indicia;

d. at least two post anchoring sockets embedded in the substantially level pavement at points centrally located



between opposed, facing end lines forming a portion of said border indicia; and

e. net means incorporating

1. a net, and

2. a pair of net posts, the lower ends of which are securely mountable within the anchoring sockets, providing rigid, upstanding supports for maintaining the net extending therebetween taut and secure,

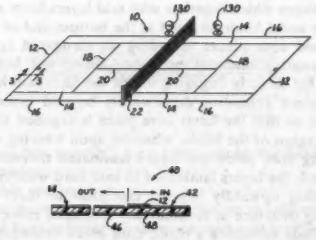
whereby a paved parking lot is easily convertible to function alternatively as either a pre-marked vehicle parking area or a pre-marked playing area complete with peripheral fencing and rigid, tautly held netting in the playing court.

3,982,759

TENNIS COURT LINE MONITORING APPARATUS

Geoffrey F. Grant, 7422 Fay Ave., La Jolla, Calif. 92037

Filed Mar. 25, 1974, Ser. No. 454,136
Int. Cl.² A63C *19/06*
U.S. Cl. 273—31 **13 Claims**



1. Apparatus adapted to detect a tennis ball landing on either a first or second side of a tennis court boundary line and providing an indication in response to the ball being detected only on said second side thereof, said apparatus comprising:

first and second switching means respectively monitoring said first and second sides of said tennis court boundary line and producing respective electrical signals in response to activation thereof;

means associated with said second switching means for measuring the time duration of said electrical signal produced thereby and for providing said indication in the event said signal is less than a predetermined time duration;

means associated with said first switching means for inhibiting said indication in response to said first switching means being activated prior to said second switching means being activated;

means for detecting the sound of a tennis ball being struck and for providing a third electrical signal in response to the detection thereof;

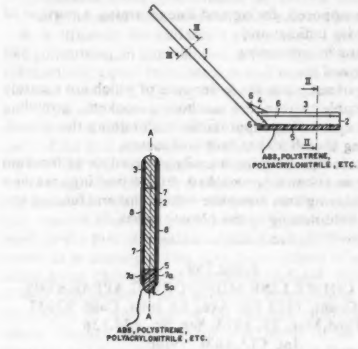
control means adapted to receive said electrical signal from said first switching means and to receive said third signal from said sound detecting means, said control means producing an indication in response to receiving said third signal when said first signal is being received.

3,982,760

STICK FOR HOCKEY OR THE LIKE

Antti-Jussi Tiitola, Tampere, Finland, assignor to Karhu-Titan Oy, Finland

Filed Nov. 26, 1974, Ser. No. 527,448
Claims priority, application Finland, Dec. 13, 1973, 3837/73
Int. Cl.² A63B 59/14
U.S. Cl. 273—67 A **12 Claims**



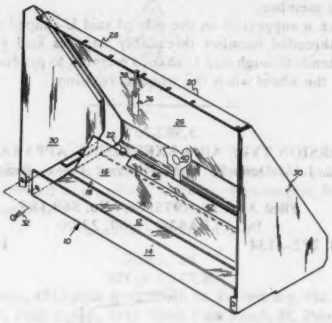
1. A stick for use in ice hockey or equivalent games, comprising an inner core and outer layers of reinforced plastic laminated with said core, said core including a plurality of core pieces which together with said layers form an elongated handle and a blade situated at the bottom end of said handle, and said core pieces including an elongated core piece of hard-wearing material extending along the bottom of the blade for directly engaging ice or the like, said hard-wearing core piece extending downwardly beyond layers laminated thereto so that the latter core piece is exposed at the bottom edge region of the blade, whereby upon wearing of said hard-wearing core piece the layers laminated thereto will not be affected, the layers laminated to said hard-wearing core piece extending upwardly beyond the latter to form therewith a bracing structure of substantially U-shaped cross section, and said blade including a blade core piece extending along and engaging an upper edge of said hard-wearing core piece and situated between and being laminated with said layers which are laminated to and extend upwardly beyond said hard-wearing core piece, so that the latter layers are laminated to and overlap both said hard-wearing core piece and said blade core piece while extending across said upper edge of said hard-wearing core piece where the latter engages said blade core piece, said hard-wearing core piece extending along the entire length of the lower edge of the blade.

3,982,761

CANTILEVERED PELLET BACKSTOP

George E. DeVogelaere, 594 Landing Road North, Rochester, N.Y. 14625

Filed Mar. 17, 1975, Ser. No. 559,324
Int. Cl.² F41J 1/12
U.S. Cl. 273—102.4 **6 Claims**



1. A range for receiving lead bullets from gas, spring and air powered guns at up to 800 feet per second, weighing up to 16 grains and of up to 0.22 calibre, comprising:

a base;

a resilient steel backstop extending from said base for receiving said pellets fired into said range;

means for mounting the bottom of said backstop in cantilevered fashion to the base;

said backstop being sufficiently thin to be damaged by said pellets if rigidly held; and

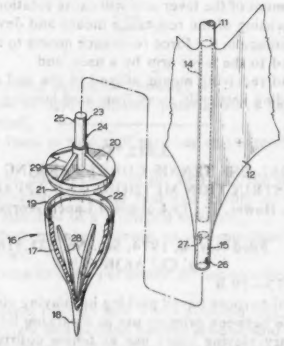
said mounting means and the thickness of the backstop combining to dissipate essentially all of the kinetic energy of fired pellets by allowing the backstop to vibrate relative to the base.

3,982,762

OUTDOOR GAME DART

Tony Milicic, Don Mills, Canada, assignor to Irwin Toy Limited, Toronto, Canada

Filed June 5, 1975, Ser. No. 583,925
Int. Cl.² A63B 65/02
U.S. Cl. 273—106.5 B **6 Claims**



1. In a field game dart having an elongated shaft including a plurality of vanes provided thereon and a weighted head

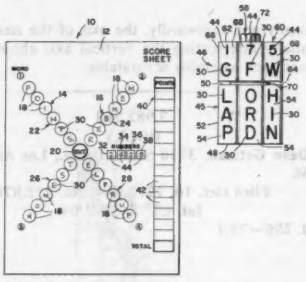
member mounted at the front end of said shaft, said head member comprising a substantially conical hollow shell having an elongated pointed front tip and a rear opening, said shell being filled with a weighting material, a cover member securely mounted over said rear opening, said cover having a central mounting pin extending outwardly from its outer surface, said mounting pin being engageable with a sleeve portion provided at the front end of said shaft for mounting said head member thereon.

3,982,763

CHANCE CONTROLLED CROSS-OUT APPARATUS

Ludwig Schlurensauer, Montrose, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed July 16, 1975, Ser. No. 596,388
Int. Cl.² A63F 3/00
U.S. Cl. 273—135 D 5 Claims



1. A word game which comprises:

a. a score card having four squares and two rows of circles thereon, each row having at least nine circles, said rows of circles crossing in an X-shape, each of said circles adapted to receive one indicia corresponding to an alphabetic letter therein, and each of said squares adapted to receive indicia corresponding to one number therein; and

b. means for rolling indicia identically corresponding to said alphabetic letter indicia and said numerical indicia simultaneously, said means comprising a bottom cylindrically shaped section having a top, a base, and a circumferential periphery, said periphery divided into eight longitudinal faces, each face extending from said top to said base; a top cylindrically shaped section having a top, a base, and a circumferential periphery, said periphery divided into eight longitudinal faces, each face extending from said top to said base; three of said alphabetic letter indicia on each face of said bottom section; one of said alphabetic letter indicia and one of said numerical indicia contained on each face of said top section; and means for rotatably joining said top of said bottom section to said base of said top section whereby the member is rolled and one of the face-up alphabetic letter indicia and one of the number indicia may be crossed off the score card.

3,982,764

ELECTRICAL GAME APPARATUS

Walter L. Dieball, 17621 Irvine Blvd., Suite 101, Tustin, Calif. 92680

Filed Apr. 30, 1975, Ser. No. 572,883
Int. Cl.² A63F 9/00
U.S. Cl. 273—135 A 6 Claims

1. An electrical game apparatus comprising:

a housing having a display panel and a switch panel;

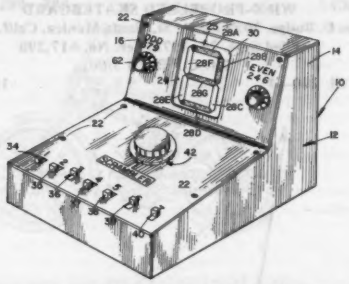
a plurality of light fixtures mounted for display in said display panel, wherein each of said light fixtures comprises:

an elongated window member; and

a light bulb positioned adjacent thereto, whereby said window is illuminated when said bulb is activated;

a plurality of master switches, equal to the number of said light fixtures, electrically connected thereto and mounted to said switch panel;

means for randomly changing the electrical connection between said light fixtures and said master switches, said means being mounted to said switch panel thereof, and



comprises a rotary mixer switch having a plurality of stationary contacts and an equal number of rotatable contacts for random engagement therebetween; and

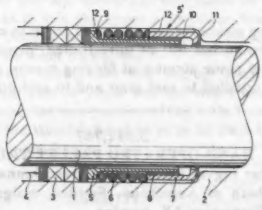
wherein each window is arranged to form a peripheral outline of a substantially rectangular configuration, said windows being disposed in an ene-to-end relationship, and having at least one window centrally positioned horizontally within said peripheral outline thereof, whereby numeral and alphabetical letters can be formed thereby when proper lighting fixtures are illuminated during the playing of said game apparatus.

3,982,765

PISTON PUMP

Kurt Gerhard Fickelscher, and Christian Michael Anders, Frankenthal, Germany, assignors to Balcke-Durr Aktiengesellschaft, Ratingen, Germany

Filed Mar. 28, 1975, Ser. No. 562,822
Claims priority, application Germany, Apr. 2, 1974, 2415848
Int. Cl.² F16J 15/44, 15/18
U.S. Cl. 277—53 7 Claims



1. A stuffing box assembly for a piston pump for displacing a fluid comprising:

an adjustable stuffing box;

at least one packing ring disposed adjacent to said stuffing box, said fluid exerting pressure on, and said stuffing box abutting against said packing ring;

a stuffing-box housing for holding said stuffing box;

a plunger disposed within said stuffing box and in contact with said packing ring;

a throttle ring;

a compression spring coaxial with said plunger and disposed between said stuffing box and said throttle ring, said

stuffing box and said throttle ring movable telescopically with respect to one another, with a throttling gap remaining therebetween;

an axial recess formed in at least one of said stuffing box and said throttle ring; and

a limit stop for making contact with said throttle ring disposed on said stuffing box housing.

3,982,766

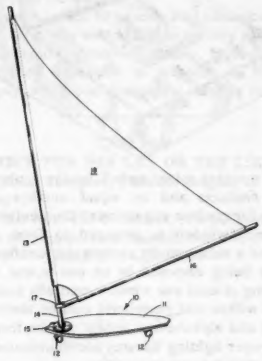
WIND-PROPELLED SKATEBOARD

James D. Budge, 2028 Euclid St., Santa Monica, Calif. 90405

Filed Sept. 29, 1975, Ser. No. 617,298

Int. Cl.² B62B *3/00*

U.S. Cl. 280—1 **10 Claims**



1. A wind propelled apparatus, comprising:

a. a body member adapted to transport a user in a standing or crouching position over a solid surface and a surface contacting means coupled to said body member so that said body member is adapted to move over a solid surface;

b. a mast which the user holds in one of his hands;

c. means for detachably coupling said mast to said body member in such a manner that said mast is substantially free from pivotal restraint about a plane parallel to the horizontal plane of said body member and is also able to articulated throughout all transverse and longitudinal vertical planes about said coupling means;

d. a boom which is held in positon by the user with his other hand;

e. hinging means for coupling said boom to said mast so that said boom has 90° of unrestricted, pivotal motion in a vertical plane about said hinging means; and

f. a sail coupled to said mast and to said boom.

3,982,767

HAND-OPERATED PALLET TRUCK

Hans Gustav Ingvar Larsson, and Sven Gunnar Harald Stjärnovist, both of Angelholm, Sweden, assignors to Marco Materialhantering AB, Sweden

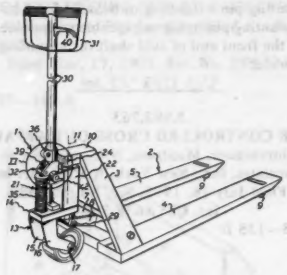
Filed June 13, 1975, Ser. No. 586,816

Claims priority, application Sweden, July 1, 1974, 7408636

Int. Cl.² B66F *5/04*

U.S. Cl. 280—43.12 **8 Claims**

1. A hand-operated truck having a combined wheel and jack assembly rotatable about a vertical axis and movable on a steerable wheel, a lift fork associated with and raisable and lowerable relative to said assembly by means of a hydraulic jack, support wheels raisable and lowerable in said lift fork, said wheel and jack assembly carrying a bar for pulling the truck, said bar comprising pumping means for raising the jack, said bar being pivotally mounted on the wheel and jack assembly, said bar having operating means for lowering the jack, said jack being mounted on a plate, said steerable wheel being mounted on a wheel fork which is connected to said plate the prongs of said wheel fork extending substantially obliquely



downwardly and rearwardly, the axis of the steerable wheel substantially intersecting the vertical axis about which said wheel and jack assembly is rotatable.

3,982,768

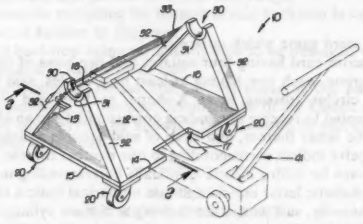
DOLLY

Alvin Dean Getman, 3710 Stewart Ave., Los Angeles, Calif. 90066

Filed Oct. 10, 1972, Ser. No. 295,878

Int. Cl.² B62B *1/04*

U.S. Cl. 280—79.1 **10 Claims**



1. A dolly for moving an automobile, comprising:

a planar rigid substantially rectangular platform member, said platform member having a forward edge, a rear edge and two end edges, said platform member having a longitudinal axis extending through the midpoints of said end edges, said platform having an upper and lower surface;

a caster mounted on the lower surface of said platform member in each of its four corners to project vertically downward therefrom, said two casters mounted along the forward edge of said platform member being of the same size, said two casters mounted along the rear edge of said platform member being of the same size;

first and second cradle members, each of said cradle members defining a channel along an axis, said channel being open at its ends and along its length for receiving a structural member on the underside of an automobile;

first and second brace structure mounted on the upper surface of said platform member adjacent one and the other end edges thereof, said first and second brace structure extending upwardly in a substantially vertical plane;

means mounting said first and second cradle members on said first and second brace structures, respectively, in laterally spaced apart positions vertically above the longitudinal axis of said platform member with their channels opening upwardly and their axes aligned along a horizon-

tally extending line substantially parallel with the longitudinal axis of said platform member; and

a cutout defined centrally in the rear edge of said platform member for fitting around an automobile jack so as to permit the positioning of said dolly below the lateral frame member or axle of an automobile when the frame member or axle is jacked up by an automobile jack engaging the center portion of the axle or frame member.

3,982,769

SAFETY BELTS

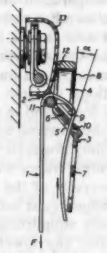
Stig Axel Göran Fürlind, Monsteras, Sweden, assignor to Stece - AB Industrifjadrar, Monsteras, Sweden

Filed Jan. 31, 1975, Ser. No. 545,913

Claims priority, application Sweden, Feb. 13, 1974, 7401886

Int. Cl.² A62B *35/00*; B60R *21/10*

U.S. Cl. 280—744 6 Claims



1. A safety belt, of the three-point type, the lap and diagonal straps of which in the position of the belt as fastened extend in V configuration transversely of the vehicle, said diagonal belt strap on one side of the seat of the vehicle being movably passed through a deflection fitting fixed to said one side, from where said strap runs into a belt retracting means which exerts a yielding pull on the belt, said lap belt strap being attached on said side to the seat or to the vehicle, the belt at the apex of the V configuration being movably passed in such a way through two spaced openings in a buckle member that the portion of the buckle member between the openings therein forms a bar located at the V apex and extending transversely of the belt, said buckle member being detachably connectable with a coupling means disposed on the other side of the vehicle seat, wherein the buckle member is so configured that the portions thereof formed with said spaced openings, make an angle with one another, said bar of the buckle member being located at the angle apex, the belt being passed in such a way through said openings that it will be situated on the side of the bar facing away from the angle apex whereby the buckle member is easily moved along the belt at least when said buckle member, upon retraction of the diagonal belt strap, reaches the deflection fitting, wherein the opening which is closest to the deflection fitting has a large extension in the longitudinal direction of the belt, said opening constituting the opening in a handle portion associated with the buckle member.

3,982,770

BICYCLE SUSPENSION

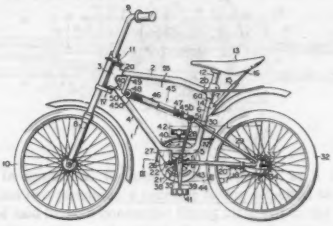
Takao Satoh, Mori, and Kazutaka Horino, Hamamatsu, both of Japan, assignors to Yamaha, Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Apr. 9, 1975, Ser. No. 566,210

Claims priority, application Japan, Sept. 12, 1974, 49-105363

Int. Cl.² B62K *25/20*

U.S. Cl. 280—284 3 Claims



1. A bicycle suspension for a bicycle having a steering head and a main frame comprising a substantially horizontal top tube extending rearward from the steering head, a down tube extending rearward and downward from the steering head, and a substantially vertical seat tube having the upper end thereof fixed to the rear end of the top tube and the lower end thereof connected to the rear end of the down tube, said bicycle suspension comprising:

a suspension frame unit comprising:

a horizontal rear fork carrying a pedal shaft and a rear wheel at the forward and rear ends thereof, respectively;

an extension forwardly extending from the forward end of the rear fork and rotatably connected to the rear end of the down tube;

a pair of first stays inclined downwardly toward the backside of the bicycle with the seat tube disposed therebetween and having the lower ends thereof fixed to the rear end of the corresponding rear fork;

a pair of second stays inclined upwardly and having the lower ends thereof fixed to the forward end of the corresponding rear fork; and

a pair of joints disposed in a space of the main frame defined by the top, down and seat tubes of the main frame so as to join the upper ends of the first stays to the upper ends of the corresponding second stays in the space of the main frame; and

a shock absorber having one end thereof pivotally connected to said pair of joints and the other end thereof pivotally connected to a portion of the main frame a little rearward of the steering head so as to be disposed in the space of the main frame.

3,982,771

SAFETY GUARD ATTACHMENT FOR BICYCLES AND OTHER TWO-WHEEL VEHICLES

Thomas F. Tropeano, 12 Revere St., Lexington, Mass. 02173

Filed Feb. 18, 1975, Ser. No. 550,533

Int. Cl.² B62J *5/20*

U.S. Cl. 280—289 R 2 Claims

1. Guard attachment for bicycles and the like comprising a guard arm and mounting means for supporting the arm in normally retracted positions at one side of a bicycle from which positions the arm may be swung outwardly into laterally projecting positions, said mounting means including a bracket holder engageable with the bicycle and a bracket device supported on the holder for releasably retaining the guard arm in the said position of adjustment, said bracket holder being

formed with a shaft aperture for receiving a bicycle wheel shaft therethrough in secured relationship, said bracket device being constructed with spaced side walls having a pivot element located transversely therethrough for pivotally supporting the guard arm, a stop element transversely received

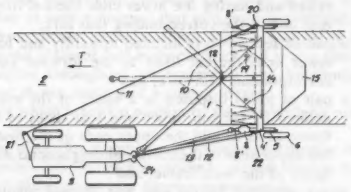
through the side walls of the bracket device for rigidly holding the guard arm in a horizontally disposed position, and one of said side walls being formed with detent means for releasably supporting the guard arm in the said laterally projecting positions.

3,982,772

APPARATUS FOR TURNING COMPOST SILO

Werner Scherer, Gottmadingen, Germany, assignor to Maschinenfabrik Fahr Aktiengesellschaft, Gottmadingen, Germany

Filed Sept. 22, 1975, Ser. No. 615,724
Int. Cl.² B60D 1/14
U.S. Cl. 280—462 10 Claims



1. An apparatus for turning a compost silo, said apparatus comprising:

a portal frame adapted to travel along the ground in a predetermined direction and having a pair of side portions spaced sufficiently apart transversely to said direction to straddle said silo,

a turning element extending transversely between said side portions,

drive means for rotating said element and including an angle drive on each of said side portions having an output connected to said element and a forwardly directed input,

a tow bar having a rear end pivoted on said frame midway between said side portions and a front end connectable to the hitch of a tractor in front of and to either side of said frame relative to said direction, and

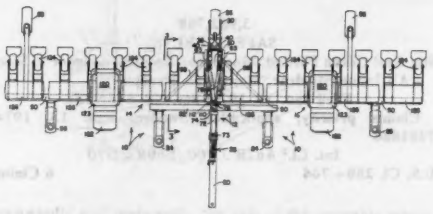
a connecting member having a front end couplable to the power takeof of said tractor and a rear end couplable to the input of the angle drive on the same side of said frame as said tractor.

3,982,773

FOLDING FRAME STRUCTURE FOR AGRICULTURAL IMPLEMENTS

John F. Stufflebeam, Romeoville, and Charles Boetto, Naperville, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Dec. 4, 1975, Ser. No. 637,785
Int. Cl.² B62B 1/00
U.S. Cl. 280—656 16 Claims



1. In a tractor-drawn agricultural implement, in combination, a folding frame structure including a central frame providing a drawbar adapted for connection to a tractor in trailing relationship, right and left toolbar frames each of which is generally of L-shaped configuration and includes a toolbar proper and a lateral frame member extending at a right angle thereto, the free ends of said lateral frame member being pivotally connected to the central frame at closely spaced points for swinging movement of the toolbar frames between extended operative positions wherein the toolbars extend transversely of the central frame and in end-to-end contiguity and the lateral frame members extend substantially parallel to the central frame, and trailing positions wherein said toolbars extend parallel to the central frame with said lateral frame members extending transversely of the central frame and in substantial end-to-end contiguity, at least one ground-engaging caster wheel operatively supporting each toolbar frame, lift means effective to raise and lower each toolbar frame relative to its associated caster wheel, means pivotally connecting each toolbar and its associated lateral frame member and effective to permit limited rocking movement of the former relative to the latter incident to undulatory travel of the caster wheel in any position of the associated toolbar frame, a hydraulic cylinder and plunger assembly effective between said central frame and toolbar frames for moving the latter between their extended and trailing positions, and releasable latch means normally maintaining said toolbar frames in their extended positions.

3,982,774

VEHICLE CRASH BAG

Michael Ivashuk, and Marvin Lee McDaniel, both of 1800 SW. Seventh Ave., Pompano Beach, Fla. 33060

Continuation-in-part of Ser. No. 292,279, Sept. 26, 1972, abandoned. This application Dec. 17, 1974, Ser. No. 533,712
Int. Cl.² B60R 21/08
U.S. Cl. 280—737 4 Claims

1. In a vehicle crash cushion of the type including an inflatable bag and a source of pressurized fluid, an improved actuator for releasing fluid from the source into the bag to inflate the latter comprising:

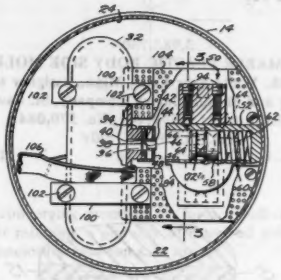
a spring-loaded member movable between a cocked position and an activated position;

a housing having a main bore in which said spring-loaded member is disposed;

a piercing member for piercing the fluid source upon movement of the spring-loaded member to its activated position;

a sear pin disposed within another bore in said housing and having one end projecting into the main bore in engagement with said spring-loaded member and normally hold-

ing the latter in its cocked position, said sear pin being retained in position by frictional engagement with said spring-loaded member, the engagement being such that said member exerts a force on said sear pin in a direction tending to move said sear pin out of contact with said member;



an inertia member movable between a normal position and a position in which it engages another end of said sear pin and partially withdraws the latter from its bore; and

at least one resilient means releasably restraining said inertia member in its normal position.

3,982,775

DEVICE FOR TIGHTENING OF A BELT FORMING PART OF A SAFETY HARNESS ASSEMBLY FOR VEHICLES

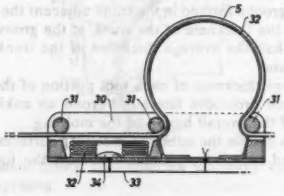
Oskar Lennart Lindblad, Hedasgatan 16, 77020 Vargarda, Sweden

Division of Ser. No. 326,135, Jan. 23, 1973, Pat. No. 3,879,054. This application Jan. 24, 1975, Ser. No. 544,000

Claims priority, application Sweden, Jan. 28, 1972, 958/72

Int. Cl.² B60R *21/10*

U.S. Cl. 280—744 **9 Claims**



1. A device for the tightening of a belt forming part of a safety harness assembly of a safety belt for vehicles in case of abnormal changes of speed of the vehicle, as for example during a collision, comprising a safety belt part, a sensor means capable of sensing said abnormal speed changes and giving off a gaseous pressure pulse in its activated condition, a power means capable of being driven by said gaseous pressure pulse and in its activated condition capable of giving at least one portion of said belt part a movement in a sidewards direction relative to the normal extension of said belt part thus forming at least one sidewards directed loop, said power means comprises a number of gas charges which can expand and said belt part having inner spaces along the longitudinal direction of said belt to be tightened, said charges being arranged in said belt inner spaces with at least one of the sides of said charges being adjacent said belt in such a way that said belt is deflected sidewise thereby contracting in the pulling direction when any of said charges are activated.

3,982,776

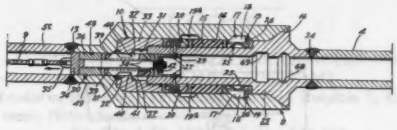
APPARATUS FOR CONNECTING SUBMARINE PIPELINES TO OFFSHORE STRUCTURES

William P. Payne, Houston, Tex., assignor to Sun Oil Company (Delaware), Dallas, Tex.

Filed Sept. 12, 1974, Ser. No. 505,406

Int. Cl.² F16L *35/00*

U.S. Cl. 285—24 **10 Claims**



1. In apparatus for connecting together at a submerged location two pipelines: a receiver fitting attached to the end of one of said lines, a connector fitting attached to the end of the other line; said receiver including means for accommodating therein said connector and being provided with a locking element which cooperates with a locking means carried by the connector to preliminarily lock the latter in said receiver; means operable from the surface for causing said connector to enter said receiver and to move to a position wherein it becomes preliminarily locked in said receiver by said locking element and said locking means; said receiver also being provided with an additional locking element which cooperates with additional locking means carried by the connector to complete the locking of the connector in the receiver; and means operable from the surface for causing said connector to move to a position wherein it becomes completely locked in said receiver by said additional locking element and said additional locking means.

3,982,777

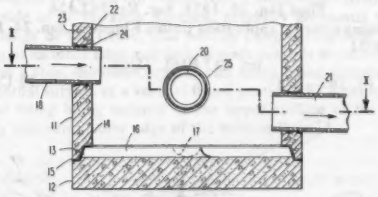
PIPE CONNECTION TO MANHOLES AND THE LIKE

Adam Eugene Martin, P.O. Box 399 R.D. 1, Narvon, Pa. 17555

Filed Mar. 14, 1975, Ser. No. 558,315

Int. Cl.² F16L *41/00*

U.S. Cl. 285—192 **7 Claims**



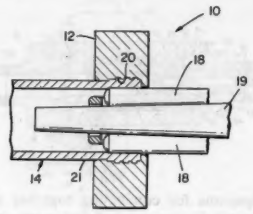
1. In a connection of a pipe through a generally round hole in the wall of a manhole or like structure, the improvement residing in a sealing structure and comprising a pair of outwardly opening tapered openings in the wall structure, one on each side of the wall where it is intersected by the hole, and a pair of resiliently compressible ring members, each ring member being arranged in wedged and resiliently compressed engagement between a portion of the wall structure that defines a said tapered opening and an adjacent longitudinally disposed portion of pipe that extends through the hole in said wall structure, said ring members and tapered openings defining means (a) clamping said pipe portion under longitudinally directed tension forces in said pipe between compressed said ring members and (b) clamping said wall structure under corresponding longitudinally directed compressive forces between compressed said ring members.

3,982,778

JOINT AND PROCESS FOR FORMING SAME

Blaine G. Spencer, Peoria; Kenneth E. Starr, Manito, and Carl Theodore Kunze, Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 13, 1975, Ser. No. 558,198
Int. Cl.² F16L 41/00
U.S. Cl. 285—222 13 Claims



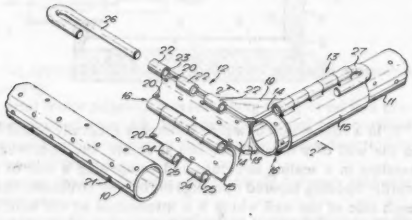
1. An improved flange-tube joint comprising a flange formulated by placing a mixture of powdered metal and a lubricant in a flange shaped mold, compressing the mixture at a pressure of at least about 4×10^7Kg. per sq. meter in said mold, removing the resulting flange from the mold, initially heating the flange in a non-oxidizing gas atmosphere at a temperature which falls within the range from about 500°C to about 1200°C to remove the lubricant, further heating the flange at a temperature which falls within the range from about 800°C to about 1500°C, cooling the flange to a temperature of no more than about 100°C and dry machining an annular channel into said flange; and a tube having an external diameter nearly equal to the diameter of said hole, one end of said tube being within said hole, said tube being formulated of a less hard metal than said flange, the external surface of said tube being expanded into said channel to thereby form said joint.

3,982,779

CLAMPS FOR JOINING TUBES OR TUBULAR STRUCTURAL MEMBERS

Christopher Daniel Dowling Hickey, Esher, England, assignor to Airflex Containers Limited, Ashford, England

Filed Jan. 20, 1975, Ser. No. 542,424
Claims priority, application United Kingdom, Jan. 24, 1974, 2649/74
Int. Cl.² F16L 25/00
U.S. Cl. 285—328 12 Claims



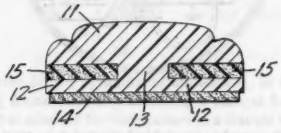
1. A clamped assembly comprising at least two tubes and a clamp for joining said tubes, the clamp comprising at least one pair of elongate co-operating semi-cylindrical clamping parts the pair of clamping parts being shaped to fit over part of the surface of at least one tube and bearing a regular array of spaced-apart surface singularities, the tube engaged by said clamping parts having complementary singularities in a similar spaced array, a hinge connecting the two clamping parts of the pair along a lengthwise extending edge of each part, the parts each having protruding portions with bores parallel to but spaced from the hinge axes and arranged to be aligned when the two parts are closed together, and a key of substantially elliptical cross-section for insertion in the aligned bores so that the pair of clamping parts, after being put around at least one tube engage the array of surface singularities on each of the clamping parts with the array of complementary singularities on the tube, the parts being tightenable onto the tube by rotation of the key.

3,982,780

CONFORMABLE PLASTIC BODY SIDE MOLDING

Roger H. Keith, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 21, 1975, Ser. No. 570,084
Int. Cl.² B60R 13/04
U.S. Cl. 293—1 12 Claims



1. Body side molding of essentially uniform cross-section comprising a tough, resilient plastic body and having at least two relatively flat surfaces for receiving an adhesive to attach the molding to the side of a vehicle, which adhesive-receiving surfaces extend across most of the width of the molding substantially to each of its sidewise extremities, other surfaces of the molding providing a tough, durable scuff- and weather-resistant, impact-absorbing and esthetically pleasing exterior, characterized by the features that

a. the plastic body is formed to have a trunk and two ankles, each defining one sidewise extremity of the molding and terminating in a foot which supports at least part of one of said adhesive-receiving surfaces,
b. the total ankle thickness is less than 50% of the overall width of the plastic body,
c. there is a channel at the underside of the trunk and at least one groove formed in the trunk adjacent the channel such that the thickness of the trunk at the groove is less than one-half the average thickness of the trunk at said channel, and
d. the average thickness of each foot portion of the plastic body which protrudes laterally beyond an ankle is less than ⅛ of the overall height of the molding,

which features enable the adhesive-receiving surfaces to conform to curved substrates without distorting the top of the molding.

3,982,781

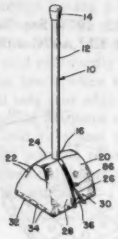
GOLF BALL RETRIEVER

Walter J. Tucker, Marion, Ind.; Melvin R. Edwards, and Richard J. Tucker, both of Eden, N.C., assignors to Walter J. Tucker, Marion, Ind.; Melvin R. Edwards and Richard J. Tucker, both of Eden, N.C.

Filed Dec. 9, 1974, Ser. No. 530,869
Int. Cl.² A63B 57/00
U.S. Cl. 294—19 A 1 Claim

1. A manually operable, portable, golf ball retriever comprising a handle, said handle being of such length to permit the user to remain in an upright position while retrieving golf balls, an inverted u-shaped yoke mounted at one end of said handle, said yoke having vertically depending spaced-apart legs, an open frame having a pair of upwardly converging members mounted opposite each other and secured to said yoke, a plurality of spaced-apart springs extending transversely across the open frame, said springs being spaced-apart from each other a distance less than the diameter of a golf ball,

a flexible cover member, said cover being a water impervious fabric having a releasable means for opening and closing said cover member, secured to said frame enveloping said yoke

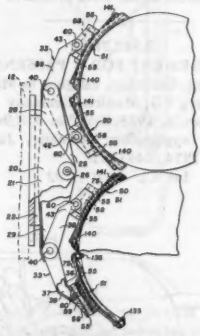


and said converging members to form a ball-receiving tent closure for retaining a plurality of retreived golf balls urged into said enclosure between said springs.

3,982,782
VACUUM LIFTING APPARATUS FOR CYLINDRICAL ARTICLES

Arie Bos, North Vancouver, Canada, assignor to MacMillan Bloedel Limited, Vancouver, Canada

Filed Apr. 21, 1975, Ser. No. 570,219
Int. Cl.² B66C *1/02*; B66F *9/18*
U.S. Cl. 294—64 R **16 Claims**



1. Vacuum lifting apparatus for generally cylindrical articles, comprising:

a support,

a rigid backing plate mounted on said support for limited swinging movement, said plate having an inner surface in cross section in a generally shallow curve from one edge to an opposite edge of the plate in order to extend over the curved surface of a cylindrical article,

a seal on the inner surface of the backing plate in the form of a continuous pneumatic tube with side sections extending along the plate near said opposite edges and spaced apart end sections extending between adjacent ends of said side sections, said seal projecting outwardly from the inner surface of the backing plate to form a cushion for a cylindrical article and a seal against said article and forming a suction space over said inner surface,

means for retaining the seal on the backing plate,

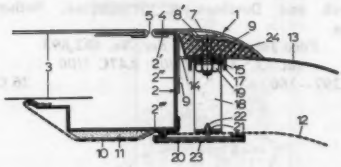
means at the backing plate through which suction can be applied to said suction space, and

a pair of spaced-apart vertical friction plates mounted on the backing plate and each located near a side section of the pneumatic tube, each of said friction plates having a horizontally convexed outer surface to be engaged by the surface of a cylindrical article bearing against said tube, whereby when the backing plate is moved to press the seal against the cylindrical article said suction retains the article against the friction plates and the seal, said swinging movement of the plate ensuring contact of the entire pneumatic tube and the friction plates with the cylindrical article and said tube ensuring good sealing contact with articles of different diameters.

3,982,783
SLIDING ROOF ASSEMBLY FOR VEHICLES AND METHOD OF MOUNTING SAME

Theodorus Hendricus Vermeulen, Richard Holplein 8, Heemstede, Netherlands

Filed Dec. 24, 1974, Ser. No. 536,308
Claims priority, application Netherlands, Jan. 2, 1974, 7400008
Int. Cl.² B60J *7/04*
U.S. Cl. 296—137 E **21 Claims**



1. A sliding roof assembly for vehicles comprising a frame, a roof member slidably mounted in said frame, a covering panel mounted on said frame and having a substantially rectangular aperture in its front portion of substantially the same size as the roof member, said covering panel having a rear portion covering the roof member when the latter is moved rearwardly to uncover said aperture, said panel having a peripheral supporting rim projecting outwardly from the frame and adapted to rest on the vehicle roof, a lining attached to the underside of an inwardly directed, generally horizontal bottom flange of the frame, said bottom flange being bent upwardly at its inner edge and then extends inwards horizontally to form a step, the outer edge of said lining being secured to an external surface of a vertical frame portion, the inner edge of said lining being secured to the upper surface of the inwardly extending inner edge of the bottom flange.

3,982,784
MULTI-FUNCTIONAL FURNITURE

Hans-Helmut Esser, Weichselstr. 28, 65-Mainz, Germany

Filed Sept. 10, 1975, Ser. No. 612,224
Claims priority, application Germany, Oct. 9, 1974, 2448188
Int. Cl.² A47C *13/00*
U.S. Cl. 297—1 **10 Claims**

1. A piece of furniture comprising:

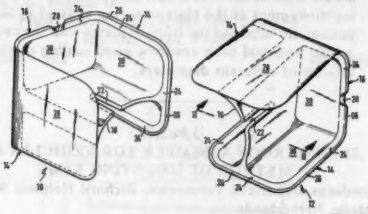
a. a back wall having two spaced edges extending in a common direction;

b. two side walls respectively joined to said edges,

1. said walls jointly defining a channel open in said common direction and having an open side remote from said back wall and bounded by said side walls; and

c. a partition transverse to said back wall and to said side walls and fixedly fastened to said back wall and to said side walls in said channel, said partition having a free

edge remote from said back wall and extending between said side walls, said partition being formed with a recess



extending inward of said partition from said free edge toward said back wall.

3,982,785

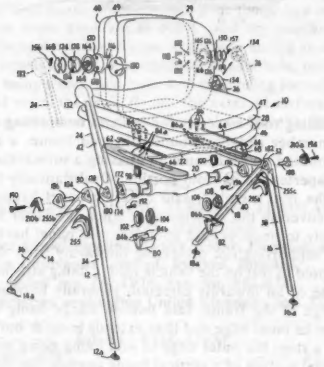
CHAIR

Emilio Ambasz, New York, N.Y., assignor to Center for Design Research and Development, Willemstad, Netherlands Antilles

Filed July 29, 1974, Ser. No. 492,693

Int. Cl.[2] A47B *39/00*; A47C *7/00*

U.S. Cl. 297—160 **26 Claims**



1. A chair comprising as the sole transverse structure of a frame of the chair a beam-like member, legs attached to and dependent from the beam-like member and supporting the beam-like member at a height essentially equal to that of a chair seat, a seat, a seat support mounted on the beam-like member and including a pair of laterally spaced-apart portions extending forwardly from regions adjacent the respective ends of the beam-like member thereby to be in cantilevered relation to the beam-like member, each said portion of the seat support having an upwardly facing concave bearing surface, and the seat being supported on said portions of the seat for movement to any position between a rearward position and a forward position, and for variation of the rake of the seat in response to said movement so that the elevation of the front end of the seat as compared to the elevation of the rear end of the seat is relatively greater when the seat is in the forward position than when it is in the rearward position, by virtue of the curvatures of the bearing surfaces of said portions, a back, and means mounting the back for limited pivotal movement independently of the seat to any position between a substantially upright position and an inclined position.

3,982,786

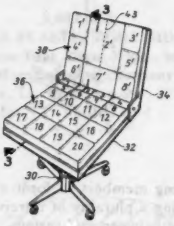
CHAIR OR ARMCHAIR

Gérard Burgin, 6, Rue de la Thur, Kingersheim, France, and Adolf Klingler, Hubertusstrasse 45, 757 Baden-Baden, Germany

Filed Sept. 23, 1974, Ser. No. 508,157

Int. Cl.[2] A47C *3/00*

U.S. Cl. 297—284 **10 Claims**



1. A fluid cushion including in combination a first and a second fluid impervious cell, the cells being disposed in a generally planar array to provide a load supporting surface, the first and second cells containing normally constant masses of fluid independent of the loading on said support surface, the first cell comprising a first and a second cushion element, the second cell being disposed intermediate the first and second elements, and means responsive to the loading on said support surface for permitting reversible fluid flow between the first and second elements upon predetermined positive and negative differences in the fluid pressures therebetween.

3,982,787

SEAT ARRANGEMENT FOR A PASSENGER CAR

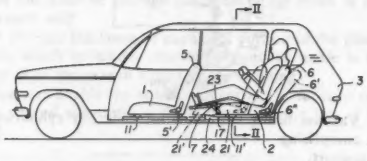
Hans Moll, Augsburg, Germany, assignor to Maschinenfabrik Augsburg-Nurnberg AG, Munich, Germany

Filed Jan. 6, 1975, Ser. No. 538,949

Claims priority, application Germany, Jan. 11, 1974, 2401241; Jan. 15, 1974, 2401741

Int. Cl.[2] A47C *1/02*

U.S. Cl. 297—317 **4 Claims**



1. A seat arrangement for a multi-purpose passenger car comprising front seat means and rear seat means, first adjusting means connected to said front seat means for adjusting the position of said front seat means relative to the length of the car, second adjusting means connected to said rear seat means for adjusting the position of the rear seat means also relative to the length of the car but independently of any adjustment of the front seat means, said rear seat means comprising back rest means having upper corners and a rear seat proper having forward and rear edges, hinge means connecting said back rest means to the rear edge of the back seat proper, whereby said back rest means is angularly adjustable relative to the vertical, substantially vertically extending cam track means located adjacent to said back rest means, connecting means at the upper corners of said back rest means arranged to ride along said vertically extending cam track means, horizontal cam track means for said rear seat proper, said horizontal cam

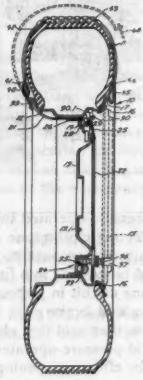
track means having a forward section which slopes down rearwardly relative to the length of the car and a rearward section extending substantially horizontally and merging into said forward cam track section, said substantially horizontally extending rearward section having a length sufficient to permit a horizontal adjustment of the rear seat proper when the latter is in its rearward positions, said forward edge of said rear seat proper riding on said rearwardly sloping forward section of said horizontal cam track when said rear seat proper is moved forward so that said rear edge of said rear seat proper is riding on said horizontal rearward section of the horizontal cam track, whereby said rear seat proper is automatically adjustable in its angular position relative to the horizontal in response to the longitudinal adjustment of said rear seat proper in its forward adjustment.

3,982,788

TIRE CHAIN APPLICATOR

Donald Brian Arney, 12287 Fulton St., Maple Ridge, British Columbia, Canada (V2X 6L4)

Filed Mar. 13, 1975, Ser. No. 558,311
Int. Cl.² B60B *15/00*
U.S. Cl. 301—44 T **3 Claims**



1. An applicator for applying flexible transverse traction members to an automobile tire mounted on a wheel assembly, the assembly having a hub and a rim, the hub having openings therethrough adjacent the rim, the applicator comprising:

a. a cog having teeth mounted on the wheel assembly adjacent each opening therein,

b. a manually operated worm-gear driving unit mounted on the wheel assembly in driving engagement with each cog for rotating the latter and being adapted to lock the cog against rotation,

c. a plurality of steel ribbons, one for each opening, and each ribbon being in meshing engagement with the cog at each opening for movement through each opening,

d. the ribbons being constructed so that when each is moved by its respective cog through the opening each curls radially outwardly around the side wall and across the tread of the tire,

e. means for connecting one end of a transverse traction member to the outside of the rim at each opening,

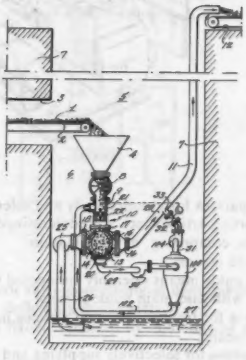
f. means for connecting an opposite end of each transverse traction member to an associated ribbon so as to enable the traction members to be drawn transversely across the tire tread when the steel ribbons are retracted by operation of the cog.

3,982,789

PROCESS AND APPARATUS FOR CONVEYING LARGE PARTICLE MINED COAL, OIL SHALE, ORE, ETC. FROM UNDERGROUND MINES OR FROM STRIP MINES VIA A PIPELINE

Erwin D. Funk, Glens Falls, N.Y., assignor to Kamyr, Inc., Glens Falls, N.Y.

Filed July 16, 1974, Ser. No. 489,038
Int. Cl.² B65G *53/30*
U.S. Cl. 302—14 **4 Claims**



1. A process of continuously conveying mined material such as particles of coal, ore, or the like, from a mine site to a remote point, said process comprising the steps of:

maintaining a flow of liquid along a first flow path from a particles entrainment position through a transfer position to a first pumping position by pumping the liquid at said first pumping position,

substantially continuously entraining mined particles from a supply of mined particles in said flow of liquid along said first flow path at said particles entrainment position,

maintaining a continuous flow of liquid along a second flow path from a second pumping position through said transfer position to said remote point by pumping said liquid at said second pumping position along said second flow path,

substantially continuously removing from communication with said first flow path at said transfer position successive volumes of mined particles larger than a predetermined size entrained in liquid while permitting liquid with mined particles smaller than said predetermined size to flow with liquid along said first flow path downstream of said transfer position to said first pumping position,

substantially continuously communicating said successive removed volumes of mined particles and entrained liquid with liquid flowing in said second path at said transfer position, and

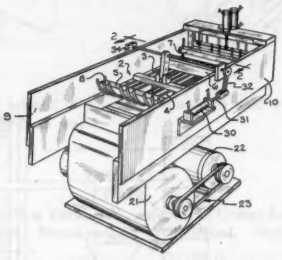
substantially continuously directing the liquid with mined particles smaller than said predetermined size flowing from said first pumping position into said second flow path.

3,982,790

AERODYNAMIC PRODUCT UNSCRAMBLING SYSTEM AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Donald William Storm, 5758 Upper Straits Blvd., Orchard Lake, Mich. 48033, and Carl Curtis Garland, 15700 Kentfield, Detroit, Mich. 48223

Filed Apr. 4, 1975, Ser. No. 565,247
Int. Cl.² B65G *53/04*
U.S. Cl. 302—31 10 Claims



1. An apparatus for automatically and selectively controllably transporting articles into a predetermined arrangement of said articles, comprising, in combination:

main guide means;

entrance guide means operably connected to and communicating with said main guide means;

first means for transporting said articles into said entrance guide means;

second means for selectively supplying and directing at least one fluid to said main guide means at a selectively adjustable and predetermined pressure and quantity, and at a selectively adjustable and predetermined direction;

article separating means operably connected to and disposed within said main guide means;

said articles being transported through said entrance guide means and into said main guide means wherein said articles are selectively adjustably and controllably transported along by said fluid; and

said article separating means separating said articles into a selectively adjustable and predetermined arrangement of said articles as said articles are simultaneously transported along by said fluid.

3,982,791

BRAKE APPARATUS TO PROVIDE POWER CUT OFF AND A SERVICE BRAKE APPLICATION UPON TRAIN SEPARATION

Esmet Walley, McKeesport, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Oct. 16, 1975, Ser. No. 622,880
Int. Cl.² B60T *13/70*
U.S. Cl. 303—3 12 Claims

1. In a locomotive brake control apparatus, the combination of:

a. a brake pipe extending from end to end of the locomotive and connected to a corresponding brake pipe extending through the cars in a train hauled by said locomotive,

b. a multi-position brake valve device operable to vary the pressure in said brake pipe,

c. a brake cylinder operable to effect a brake application and a subsequent brake release on the locomotive

d. a control valve device connected to and operable in response to variations of pressure in said brake pipe to control the supply of fluid under pressure to and the release of fluid under pressure from said brake cylinder,

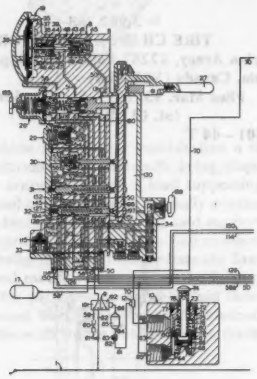
e. a fluid pressure operated locomotive power supply cutoff device, wherein the improvement comprises:

f. a brake application valve device operable upon the release of fluid under pressure therefrom to effect the supply of fluid under pressure to said power supply cut-off device to cause operation thereof to cut off the supply of power to the locomotive,

g. an electro-responsive valve means operable upon deenergization thereof to release fluid under pressure from said brake application valve device, and

h. circuit means for controlling energization and deenergization of said electro-responsive valve means, said circuit means comprising:

(i) two parallel-arranged circuits,



(ii) a first fluid-pressure-operated switch device having a contact for effecting closing one of said two parallel-arranged circuits in response to an increase in the pressure in said brake pipe to a first chosen value, and opening said one circuit in response to a reduction of the pressure in said brake pipe to a second chosen value that is less than said first chosen value, and

(iii) a second fluid-pressure-operated switch device having a contact for effecting opening of the other of said two parallel-arranged circuits by a first pressure that is in excess of said first chosen pressure in response to movement of said multiposition brake valve device to one of its positions, and closing said other circuit by a second pressure that is less than said first chosen pressure but in excess of said first chosen value in response to movement of of said multi-position brake valve device to another of its positions.

3,982,792

EMERGENCY BRAKE SYSTEM FOR A VEHICLE

Norio Nakajima, Sagamihara, Japan, assignor to Caterpillar Mitsubishi Ltd., Tokyo, Japan

Filed Nov. 17, 1975, Ser. No. 632,329
Claims priority, application Japan, Nov. 29, 1974, 49-136219
Int. Cl.² B60T *13/22, 17/18*
U.S. Cl. 303—6 A 6 Claims

1. An emergency brake system for a vehicle of the type including separate fluid operated front and rear wheel service brakes and a control system having separate front and rear fluid conduits for individually conducting pressurized fluid to such brakes to effect their application, comprising:

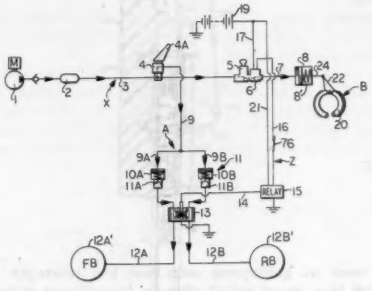
an emergency brake;

pressure differential detecting means connected to each of the fluid conduits for detecting a difference in the fluid pressures of the conduits;

means connected to said detecting means and to said emergency brake for automatically applying said emergency brake when the service brakes are applied and the difference in the pressures of the conduits is beyond a predetermined value;

a source of pressurized air;

an air releasing motor connected to said emergency brake and including spring means to effect application of said emergency brake, said motor being responsive to a predetermined air pressure to effect the release of the emergency brake; and



said means for automatically applying said emergency brake includes a solenoid operated air bleed valve for normally communicating pressurized air from said source to said second air releasing motor, and electric circuit means operative in response to said pressure detecting means to open said solenoid operated air bleed valve so as to exhaust the air from said air releasing motor, thereby effecting the application of the emergency brake.

3,982,793

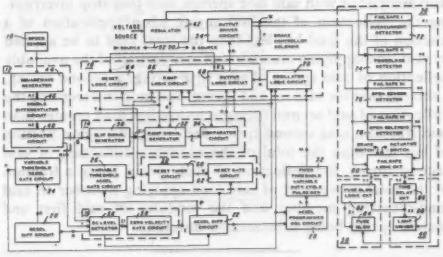
VEHICLE SKID CONTROL SYSTEM

James J. Jones, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed June 27, 1972, Ser. No. 266,798

Int. Cl.² B60T *8/08*

U.S. Cl. 303—21 P **28 Claims**



1. A vehicle brake control system for selectively controlling the engagement and disengagement of the brake system of the vehicle in accordance with selected braking conditions, comprising in combination:

a. first signal means for generating a first control signal when the relationship between signals representing vehicle speed and vehicle wheel speed is at a predetermined condition;

b. second signal means for generating a second control signal when the vehicle wheel speed rate of change is at a first value and a third control signal when the vehicle wheel speed rate of change is at a second value;

c. third signal means for generating a fourth control signal proportional to selected condition of said vehicle wheel speed after said first and second values are reached; and

d. logic means selectively responsive to said first, second, third and fourth control signals for:

i. disengaging the vehicle brake system when said predetermined condition and said first value are reached, and

ii. sequentially engaging and disengaging the vehicle brake system when said predetermined condition and said second value are reached.

3,982,794

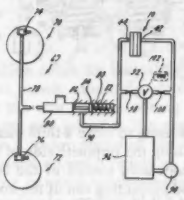
VELOCITY RATE CHANGE SENSITIVE FLUID VALVE

Denny D. Colovas; John S. Logan, and Roland L. Mniece, all of Dearborn, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 7, 1976, Ser. No. 644,244

Int. Cl.² B60T *8/093*

U.S. Cl. 303—24 A **3 Claims**



1. A fluid control valve comprising in combination:

housing means defining a fluid cavity;

a shaft member fixedly received by said housing within said fluid cavity;

first and second fluid passage means extending through at least a portion of said shaft member and arranged to communicate said fluid cavity to the exterior of said housing;

said first and second fluid passage means having a plurality of passage openings arranged at the surface of said shaft member exposed to the fluid cavity;

a pendulum member supported within said fluid cavity for pendulous movement about said shaft member;

means defining a fluid passage extending through at least a portion of said pendulum means;

said pendulum fluid passage means arranged to cooperate with said plurality of first and second fluid passage means passage openings and operative upon pendulous movement to inter-communicate selected ones of said passage openings whereby fluid communication may be established through the valve.

3,982,795

MULTI-CIRCUIT AIR-BRAKE SYSTEM, IN PARTICULAR FOR MOTOR VEHICLES

Hans Grüner, Edingen, Germany, assignor to Graubremse GmbH, Heidelberg, Germany

Continuation of Ser. No. 470,168, May 15, 1974, abandoned. This application Dec. 22, 1975, Ser. No. 643,087

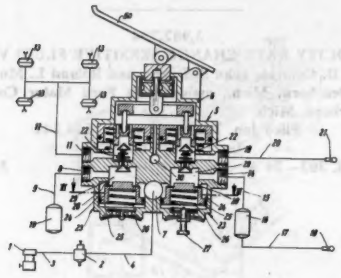
Claims priority, application Germany, May 17, 1973, 2324873

Int. Cl.² B60T *15/08*

U.S. Cl. 303—52 **11 Claims**

1. A multi-circuit brake system comprising a plurality of tanks for holding a fluid; a plurality of brake lines for applying fluid to braking apparatus of at least one vehicle; a brake valve including a housing defining a plurality of circuits each connected to an associated different one of the tanks and an associated different one of the brake lines, said brake valve further including valve means disposed in said circuits for

controlling the flow of fluid from the tanks to the brake lines; supply means for supplying compressed fluid; and a plurality of safety valves each connected to an associated different one of the tanks via a portion of an associated different one of the circuits of the brake valve, said safety valves being directly connected in common to the supply means for controlling the flow of fluid from the supply means to the tanks; each of said safety valves including a piston and a spring mounted on one side of the piston for spring-biasing the piston against a projecting rim of the housing to close a fluid passage passing from the supply means along the opposite side of the piston and via a portion of the associated circuit of the brake valve to the associated tank, said projecting rim of the housing dividing the surface area of said opposite side of the piston into a first surface area under pressure of the fluid in the associated tank and a second surface area under pressure of the compressed fluid from the supply means whereby one or both of those pressures may bias the piston against the spring and away from the projecting rim of the housing to open said fluid passage.



3,982,796

THRUST BEARINGS

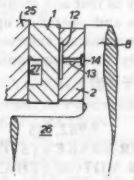
Alfred Hill, Abbots Langley, England, assignor to The Glacier Metal Company Limited, Wembley, England

Filed Feb. 22, 1974, Ser. No. 444,698

Claims priority, application United Kingdom, Feb. 28, 1973, 9702/73

Int. Cl.² F16C *17/06*

U.S. Cl. 308—122 **7 Claims**



1. A thrust bearing comprising

an annular series of thrust pads

each having a bearing surface for carrying thrust from a relatively rotating load surface and an opposed rear surface supported from the surface of a pad carrier,

there being a first passage through the pad for supplying oil to the bearing surface of each pad;

a pocket in the bearing surface of each pad;

a recess at the center of the rear surface of each pad between the rear surface and the carrier surface; and

a second passage leading through the pad from the pocket to the recess for leading oil pressurized hydrodynamically by rotation between the bearing surface and the load surface to act to support the pad from the carrier non-positively.

3,982,797

SPRING-LOADED BEARINGS FOR IN-HOLE MOTORS

John E. Tschirky, Long Beach, and Bela A. Geczy, Glendale, both of Calif., assignors to Smith International Corporation, Inc., Newport Beach, Calif.

Filed July 11, 1975, Ser. No. 595,162

Int. Cl.² F16C *17/04, 19/04*

U.S. Cl. 308—139 **18 Claims**

1. A spring-loaded thrust bearing system comprising a load-applying member, a load-receiving member, said members movable longitudinally relative to each other from an unload position to a load-applying position to said load-receiving member for application of a load, a thrust bearing between said members in thrust-bearing relation between said members, a plurality of springs arranged in series between one of said members and said thrust bearing, said springs positioned to transmit said thrust through said springs to said bearing, said plurality of springs including a first of said springs, a first stop associated with said first springs, said first stop interrupting the deflection of the first spring upon application of a fraction of the load but less than the total load to be applied by said load-applying member and at a portion of the available deflection of said spring of said first spring, a second spring, a second stop for said second spring, said stop interrupting the deflection of said second spring at an applied load greater than said fraction, said second spring deflecting through a portion of but less than the total of the available deflection of said second spring, the deflection of each spring being a fraction of the total movement of said load-applying member to said load-receiving member and the modulus of said first and second spring being substantially different.

3,982,798

STORAGE APPARATUS

Charles G. Fellwock, Evansville, Ind., and Charles R. Russell, Southfield, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

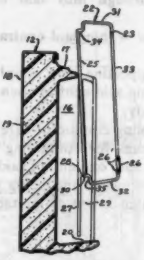
Filed Feb. 18, 1975, Ser. No. 550,546

Int. Cl.² A47B *51/00*

U.S. Cl. 312—138 A **4 Claims**

1. Storage apparatus, comprising: a vertical door having storage space for articles comprising an inwardly facing recess; a transverse article supporting shelf means in said recess; a generally vertically movable article retaining rack extending across said recess in the vicinity of said shelf means to retain

articles within said recess and on said shelf means; and cooperating sliding guide and track means on said door and said rack for sliding movement of said movable rack in a generally vertical path to an elevated position exposing said shelf means for access thereto, said storage apparatus comprising refrigeration apparatus and said door comprising an inner liner shaped to provide said inwardly facing recess, said liner including substantially vertical track grooves at the laterally opposite sides of said recess engaged by side members on said rack for providing said sliding movement of said rack.

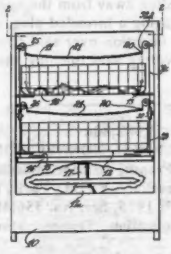


3,982,799

DISH STABILIZING MECHANISMS FOR DISH-WASHING MACHINES

James M. Murray, 9129 S. Crescent Court, Oak Lawn, Ill. 60453

Filed May 27, 1975, Ser. No. 581,145
Int. Cl.² B08B *3/02, 9/08*
U.S. Cl. 312—270 **2 Claims**



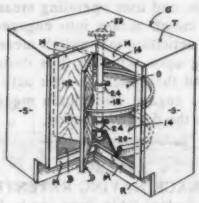
1. In a dish washing machine having a door and at least one work-basket for dishes to be washed, a mesh-unit located above the space into which the work-basket is insertible when the door is open, and means between the door and the mesh-unit causing the latter to descend into the work-basket as the door is closed, the mesh then draping over and between the dishes to hold them apart and against turning during the dish washing operation, the mesh-unit having supporting bars opposite the sides of the machine, and said mechanism comprising horizontal rollers journaled near such sides, and cords leading from the door and trained over the rollers to connect with the supporting bars and suspend the mesh-unit from the cords.

3,982,800

ROTARY-POSITION CATCH FOR ROTATABLE CORNER SHELF UNITS

Howard Bryon Gorton, San Gabriel, and Warren Hall Miller, Claremont, both of Calif., assignors to Ajax Hardware Corporation, City of Industry, Calif.

Filed Feb. 23, 1976, Ser. No. 660,372
Int. Cl.² A47B *81/00*
U.S. Cl. 312—305 **7 Claims**



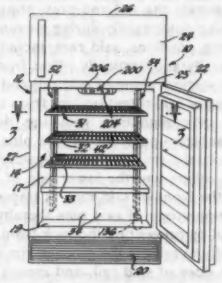
1. A rotary-position catch for rotatable storage units comprising an integral plastic mounting plate having a central pivot bearing for the unit and an oblong resilient ring surrounding the bearing and joined to the plate at diametrically opposite points on a major diameter, the ring having recess means at diametrically opposite points on a minor diameter; and a sleeve having outward catch-engaging lug means, the sleeve being adapted to be secured to the storage unit on the axis of rotation thereof, said lug means extending outward from the sleeve to a point slightly farther from the axis than the ring at the minor diameter whereby the lug means forcibly engages the ring when adjacent the recess means and snaps into the recess means to effect the catching action.

3,982,801

POWER-OPERATING VERTICALLY ADJUSTABLE CANTILEVER SHELVES FOR APPLIANCE CABINETS

John H. Heidorn, and James A. Bernard, both of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 17, 1975, Ser. No. 632,293
Int. Cl.² F25B *49/00*; F16M *1/00*
U.S. Cl. 312—306 **4 Claims**



1. In a refrigerator cabinet or the like having a plurality of walls including a rear wall defining a storage compartment and an access opening thereto, a shelf adjustor mechanism for vertically moving a shelf within said compartment, said mechanism comprising a pair of vertical stringers secured to said rear wall, each said stringer having a vertically extending series of ratchet teeth formed on a rearwardly facing surface thereof, driven shaft means disposed transversely on said shelf adjacent the rearward portion thereof having a pair of driven gears thereon, each driven gear in meshed engagement with one of said stringer ratchet teeth, a pair of shelf roller means pivotally supported on a common transverse axis offset rear-

wardly and below said shelf driven shaft means whereby each said roller means tracks on a forwardly facing stringer surface, drive means for said mechanism including a drive shaft coupled to a reversible drive motor extending vertically adjacent the rear wall, gear means associated with said shelf through which said shelf driven shaft means is rotated, clutch means for connecting said drive shaft with said shelf gear means operable to rotate said shelf driven shaft means in either direction, manually operable selectable switch means enabling the user to energize said motor to rotate said drive shaft in one or another direction, and user operating means on said shelf for actuating said clutch means into engagement; whereby upon the user first actuating said switch means to a selected position, depending upon whether it is desired to raise or lower said shelf, and thereafter the user actuating said shelf operating means to engage said clutch means said shelf is moved vertically to the desired location.

3,982,802

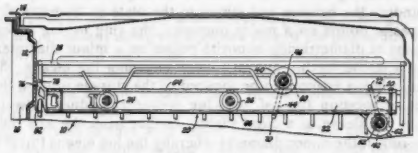
DISHWASHER RACK HAVING RETENTION MEANS

Paul D. Bailey, Kettering, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 3, 1975, Ser. No. 628,375

Int. Cl.² A47B *88/04*

U.S. Cl. 312—348 **5 Claims**



1. In a dishwasher of the front loading type having a washing chamber and an access opening thereto, a dish supporting rack slidably mounted in the chamber for movement between a loading position wherein the rack extends at least partially out through the access opening and a washing position wherein the rack is fully within the chamber, the improvement comprising a supporting rail at each side of said rack affixed to a side wall of the washer chamber, a pair of rollers affixed on said rack at the rear thereof, said rollers being both laterally and vertically offset from each other and each having a grooved rim astride opposite sides of said rail adapted for keeping the rack astride the rail and preventing the front of the rack from tipping downwardly during movement between loading and washing positions, said rack including a pair of retention pins laterally and vertically offset from each other extending into the vertical plane of said rail and spaced from said rail, the spacing of said retention pins from said rail being sufficiently close in conjunction with the depth of said grooved rims so that the upper one of said pins engages said rail as the front of said rack is tipped upwardly about the upper one of said rollers and the lower one of said pins engages said rail as the front of said rack is tipped further upwardly about the upper one of said pins thereby to keep the rack astride the rail by preventing the rack front from tipping sufficiently upwardly to release the grooved rim of each roller from the opposite sides of said rail, and means between the front of said rail and the lower one of said pins for releasably latching said rack against removal from said rail when the rack is in its loading position.

3,982,803

CABLE AND CONVERTER SECURITY DEVICE

Harry A. Bennett, 17513 Lorne St., Northridge, Calif. 91324

Filed Mar. 17, 1975, Ser. No. 558,791

Int. Cl.² H01R *13/62*

U.S. Cl. 339—37 **1 Claim**

1. In a system wherein it is desired to prevent unauthorized connection of a coaxial coupling device to a coaxial cable by requiring the use of a special tool means for affording coupling to the central conductor of said coaxial cable, said coaxial coupling device comprising

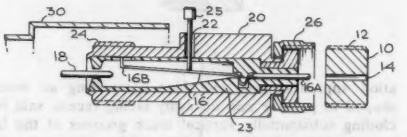
a conductive cylindrical body having a central cylindrical opening extending therethrough,

insulating wall means closing one end of said conductive cylindrical body, said wall means having a central opening for enabling the insertion of said coaxial cable central conductor therethrough into said central cylindrical opening,

a coupling conductor within said central cylindrical opening,

insulating means supporting said coupling conductor between its ends within said central opening of said conductive cylindrical body,

one end of said coupling conductor extending towards said insulating wall means for contacting said coaxial cable central conductor, said one end of said central conductor having resilient properties and being yieldably biased to a first position which is out of contact with an inserted



coaxial cable central conductor, and being movable to a second position for affording contact with a coaxial cable central conductor which is inserted through said insulating wall means after said central conductor one end is moved to said second position,

means for affording access to said resilient one end of said central conductor consisting of

an opening in said cylindrical body positioned for enabling removable insertion therethrough of said tool means for moving said resilient one end of said central conductor from its first to its second position,

means forming a bushing at the end of said conductive cylindrical body opposite to the end toward which said one end of said central conductor extends,

a threaded nut pressed upon said bushing and having a threaded end extending away from the end of said cylindrical body for engaging a threaded plug, and

a hollow cylinder for insertion over said conductive cylindrical body for covering said opening therein and said threaded nut.

3,982,804

SELECTIVE ELECTRICAL CONNECTION DEVICE

Gilles Marechal, Paris, France, assignor to Societe d'Exploitation des Procedes Marechal S.E.P.M., Paris, France

Filed Mar. 7, 1975, Ser. No. 556,480

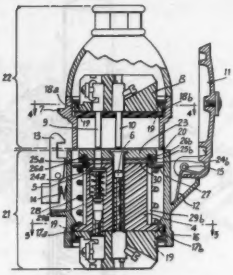
Claims priority, application France, Mar. 14, 1974, 74.08636

Int. Cl.² H01R *13/44*

U.S. Cl. 339—41 **6 Claims**

1. A selective electrical connection device comprising a housing arranged to support a centrally perforated insulating socket member having an end wall, said socket member having a plurality of means defining openings therein arranged in predetermined spaced relation around said central perforation and adapted to slidably support electrical contact means, plural juxtaposed disc members associated with said end wall of said socket member, resilient means encompassing said socket member and adapted to support a washer means, said washer means including means cooperating with said juxtaposed disc members to prevent inadvertent rotary movement thereof, plug means arranged for assembly with said insulating support member, said plug means having a collar element arranged to be interposed between the socket member and the

housing upon electrical connection being established, a central ground contact element for cooperation with said perforation in said socket member and a further electrical contact element laterally spaced therefrom supported on said plug means arranged to be associated with at least one of said electrical contact means spaced around said central perforation in said socket member when said collar element is inserted into said housing to depress said resilient means thereby disengaging said washer from said juxtaposed disc members to permit relative rotation thereof and engagement of said electrical contact element with at least one of said electrical contact means carried by said socket member.



3,982,805

ELECTRICAL CONNECTOR AND HOUSING THEREFOR

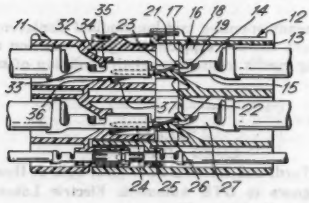
Norimitsu Irie, Kawasaki, Japan, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 21, 1975, Ser. No. 634,109

Claims priority, application Japan, Nov. 29, 1974, 49-143849[U]

Int. Cl.² H01R 13/40

U.S. Cl. 339—59 R **5 Claims**



1. A housing for an electrical terminal of the type having a resilient locking tongue with a rearwardly directed free end, which housing is molded from plastics material with a terminal-receiving passageway open to a rear of the housing and a locking abutment having a forward face engageable by the free end of the locking tongue in a snap fit on insertion of the terminal front first into the passageway from the housing rear, and a resilient tongue pusher extending across the passageway forward of the abutment face and engageable behind the tongue to retain the free end of the tongue in alignment with the abutment face.

3,982,806

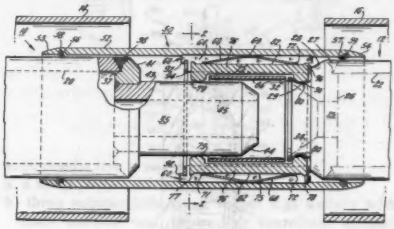
PLUG-IN ELECTRIC CONTACT WITH IMPROVED CONTACT FINGER SUPPORT AND SHIELDING

Walter M. Wilson, and John W. Katzbeck, Jr., both of Greensburg, Pa., assignors to I-T-E Imperial Corporation, Spring House, Pa.

Filed Apr. 3, 1975, Ser. No. 564,695

Int. Cl.² H01R 13/62

U.S. Cl. 339—64 R **14 Claims**



13. A plug type connector assembly, comprising:

first and second annular conductors of substantially equal diameter, surrounded by an annular conductive housing; each of said conductors having an end adjacently spaced from the end of the outer said conductor;

each said adjacent end of said first and said second conductors having an axial, conductive plug element of diameter reduced from that of the external diameter of said first and said second conductors to a slight extent;

an annular, hollow shield of conductive material having a substantially constant internal diameter that is slightly greater than the external diameters of said first and said second conductors, said shield extending completely across both said plug elements and extending a short distance over both said conductors; retaining means for holding said shield in place over said first and second conductors and across said plug elements;

a plurality of axially extending, elongated contact fingers which are annularly arrayed at spaced intervals about the interior of said shield; said contact fingers each having a radially inwardly directed contact lobe at one end of each said finger; the inward end of each of said contact lobes of each of said contact fingers engaging the external surface of one of said plug elements, the ends of each of said fingers opposite to said end containing said contact lobe being fixed to the other said plug element;

said inwardly directed contact lobes extending from each of said contact fingers making sliding engagement with said one of said plug elements to maintain good electrical engagement between said plug elements while enabling relative movement between said first and said second conductors;

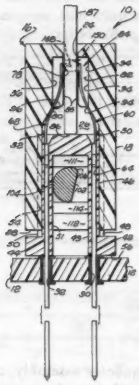
respective spring biasing means provided along the interior of said shield for each of said contact fingers and engaging said shield and said respective contact fingers; said spring biasing means urging each of said fingers inwardly and away from the interior surface of said shield, whereby said plug elements may have relatively large diameter because the space between them and said shield contains said fingers and said biasing means for urging said fingers.

3,982,807

ZERO FORCE PRINTED CIRCUIT BOARD CONNECTOR

John W. Anhalt, Orange, and James H. Curley, Costa Mesa, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 27, 1975, Ser. No. 562,552
Int. Cl.² H01R 13/54
U.S. Cl. 339—75 MP 5 Claims



1. A printed circuit board connector comprising:

an elongated mounting member having a generally flat lower surface adapted to be mounted on a planar substrate having holes therein;

two rows of resilient contacts, each contact having a lower mounting portion, an upper contacting portion and an inclined intermediate region between said upper and lower portions, the mounting portions of said contacts in each row being mounted in said mounting member, the intermediate regions of said two rows of contacts being inclined toward each other;

each said contact having a lower end below said mounting portion thereof, said lower ends of said contacts extending below said lower surface of said mounting member and being adapted to extend into said holes;

an elongated hollow insulative housing movably mounted over said contacts and having sidewalls slidably engaging the sides of said mounting member, said housing having a printed circuit board receiving slot therein overlying the area between said two rows of contacts;

said housing having cam surface means thereon engaging said intermediate regions of said contacts, said cam surface means shifting said upper portions of said contacts transversely toward a vertical plane passing through said slot upon relative movement of said housing toward said mounting member; and

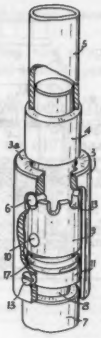
elongated rotatable cam means in said mounting member extending lengthwise between said two rows of contacts and above said lower surface, said cam means cooperating with said housing so that upon rotation of said cam means said housing and mounting member are slidably moved toward each other to shift said contacts, said cam means having actuation means adjacent to one end of said housing.

3,982,808

SINGLE WIRE ELECTRICAL CONNECTOR

Gilles Marechal, Paris, France, assignor to Societe d'Exploitation des Procedes Marechal S.E.P.M. (Societe Anonyme), Paris, France

Filed May 7, 1975, Ser. No. 575,367
Claims priority, application France, May 9, 1974, 74.16068
Int. Cl.² H01R 7/32, 13/54
U.S. Cl. 339—88 R 8 Claims



1. A connector for joining two lengths of electrical high current cables together including a male terminal on the end of one cable and a female terminal on the end of the other cable,

said male terminal including a front face for engagement with a front face on said female terminal to provide electrical contact between said two cables, and matching means for engaging complementary matching means on said female terminal for preventing relative rotation between said terminals,

said female terminal comprising a socket with a front face for engaging said front face on said male terminal upon insertion of the male terminal into the female terminal and incorporating matching means for engaging the matching means on said male terminal,

a sleeve freely rotatably mounted upon said female terminal and incorporating means tending to cause longitudinal relative movement of said cables toward one another upon rotation of said sleeve, thus causing longitudinal displacement of said sleeve toward said male terminal, and

resilient means opposing said longitudinal displacement of said sleeve thereby supplementing the function of said matching means to prevent relative rotation of said cables.

3,982,809

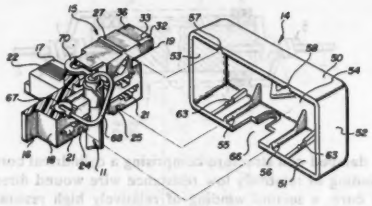
CORD ADAPTER

Ronald C. Ward, and Richard B. Kosten, both of Huntsville, Ala., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 29, 1975, Ser. No. 644,981
Int. Cl.² H01R 7/28, 13/10
U.S. Cl. 339—91 R 11 Claims

1. A cord adapter for use with a telephone line cord including a plurality of conductors for making electrical connections between the conductors of the line cord and electrically conductive contacts of the cord adapter, the line cord having a cord holder on the end thereof and each of the conductors having a spade terminal on the end thereof, said cord adapter comprising: a plug molded of a non-conductive material, a removable snap-on cover for said plug molded of a non-conductive material, said plug comprising: a miniature terminal plug and terminal block which are integrally formed, said

terminal block having formed therein a plurality of terminal cavities, each of which is proportioned to receive therein at least one of said spade terminals on the ends of said conductors of said line cord, an electrical contact disposed within the respective ones of said terminal cavities and extended into said miniature terminal plug such that other electrical connections can be established with said electrical contacts, cooperative locking means integrally formed on said plug, said cover comprising: a bottom wall and four side walls all proportioned

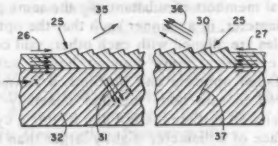


to receive therein said plug with only said miniature terminal plug extending therefrom, cooperative locking means formed on ones of said side walls for mating engagement with said locking means on said plug, said locking means on said side walls and on said plug being releasably lockingly engaged to secure said cover with said plug when said cover is forcibly urged over said plug, whereby said spade terminals can be disposed within said terminal cavities in said terminal block in said plug and said cover affixed to said plug without the need of any tools.

3,982,810
DIRECTIONAL RADIATION BY ASYMMETRICAL DIELECTRIC GRATINGS

Theodor Tamir, Teaneck, N.J., and Song-Tsuen Peng, Brooklyn, N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 9, 1975, Ser. No. 594,416
Int. Cl.² G02B 5/14
U.S. Cl. 350—96 C **10 Claims**



2. A method of concentrating the power in a thin film optical device from an incident surface wave into a beam that appears selectively either above or below the dielectric grating of the device comprising:

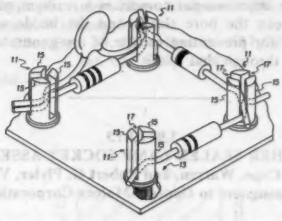
discriminating between the regions above and below the grating by introducing an asymmetric profile in the grating;

said asymmetric profile selected so as to concentrate energy incident from one direction in said film in a beam leaked into the region above the grating and from the opposite direction in a beam leaked into the region below the grating.

3,982,811
ELECTRICAL TERMINAL

Bernard K. Siu, and Richard D. Allemang, both of Cedar Rapids, Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 22, 1975, Ser. No. 615,277
Int. Cl.² H01R 13/58
U.S. Cl. 339—105 **12 Claims**



1. A conductive terminal comprising:

a. a body portion having an axis of symmetry,

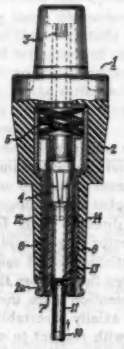
b. three substantially equal length legs unitary with said body portion and protruding therefrom substantially parallel to said axis, and

c. three substantially straight slots, each defined by two different ones of said three legs, said three slots joining near said axis and radiating outward to the side of said terminal.

3,982,812
POWER CABLE SEPARABLE CONNECTOR HAVING GASKET MEANS FOR RESTRICTING THE FLOW OF ARC-GENERATED GASES THEREFROM

Vincent J. Boliver, Pittsfield, Mass., assignor to General Electric Company

Filed Oct. 1, 1973, Ser. No. 402,596
Int. Cl.² H01R 15/02
U.S. Cl. 339—111 **10 Claims**



1. A separable connector module for connecting electrical power distribution cable, the module being of the type including:

an insulating housing having an open contact-receiving passageway therein extending from a first end of said housing a predetermined distance into said housing and terminating in a gas expansion chamber;

a hollow, cylindrical, bore sleeve telescopingly fit inside said passageway of said housing;

an electrical contact member inside said passageway and rigidly fixed to said bore sleeve, and a gas activated piston for moving said bore sleeve along said passageway, said piston being disposed in said chamber and having an opening through which gases generated in said passageway by arcing from said contact member can pass from said passageway into said chamber,

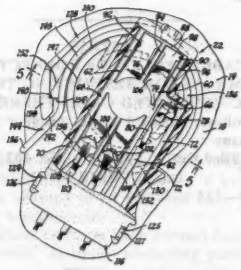
wherein the improvement comprises a resilient gasket in the space between the bore sleeve and the inside wall of said passageway for preventing escape of arc-generated gases to the outside through that space.

3,982,813

WEATHER SEALED LAMP SOCKET ASSEMBLY

Kenneth P. Cope, Warren, and Robert G. Plyler, Vienna, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 19, 1975, Ser. No. 633,424
Int. Cl.² H01R *13/52, 13/54*
U.S. Cl. 339—127 R **3 Claims**



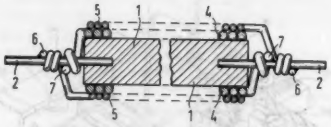
1. A lamp socket and panel assembly for sealing a lamp housing having a panel exposed to ambient weather conditions comprising: a rear panel with inner and outer surfaces thereon including a lamp socket access opening therethrough having radially outwardly directed slots formed circumferentially therearound, a deflector ring on said rear panel outer surface formed circumferentially around said opening to shield said opening against water flow across the outer surface, a lamp socket including retention ears thereon at circumferential points therearound axially insertable through said ring and slots and rotatable with respect to said panel to secure said socket thereon, said ring having a catch thereon with a lead ramp and notch at a point circumferentially spaced from said retention slots, said socket having a flexible manually releasable lock arm thereon positioned in axial alignment with said ring when the socket is in place and having a surface thereon that rides circumferentially across said lead ramp upon rotation of said socket within said opening, said lock arm being spring biased into said notch to produce an audible signal to indicate positioning of said socket in a rotatably locked position on said panel.

3,982,814

DAMPENED CHOKE COIL

Hans-Peter Kaiserswerth, Regensburg; Josef Wimmer, Wenzenbach, and Rudolf Schaller, Regensburg, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 9, 1973, Ser. No. 339,739
Claims priority, application Germany, Mar. 17, 1972, 2213118; Mar. 17, 1972, 2213186
Int. Cl.² G05F *3/00*
U.S. Cl. 323—78 **6 Claims**



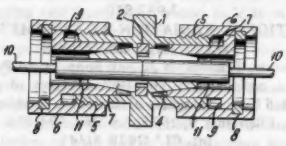
1. A damped coil structure comprising a cylindrical core, a first winding of relatively low resistance wire wound directly on the core, a second winding of relatively high resistance material being directly wound against the first winding, the ferromagnetic core having outer connection parts embedded therein at opposite ends, the second winding being dc isolated from the first winding and having more than 25% more turns than the low resistance winding.

3,982,815

CONNECTOR FOR LIGHT-TRANSMITTING CABLES

Osamu Nakayama, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed June 3, 1975, Ser. No. 583,163
Claims priority, application Japan, June 5, 1974, 49-63782
Int. Cl.² G02B *5/16*
U.S. Cl. 350—96 C **2 Claims**



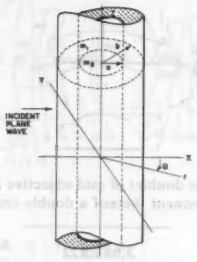
1. A connector adapted to optically connect a pair of light-transmitting cables, each of which is respectively secured to tubular terminal members of substantially the same predetermined outer diameter, in a manner such that the optical axes of the two cables are aligned with each other; said connector comprising a cylindrical body member having axially and externally threaded opposite end portions, a flexible sleeve member secured in said body member coaxially with the cylindrical inner wall surface thereof and having a cylindrical inner wall surface of a diameter slightly larger than the outer diameter of the tubular terminal members, a tapered outer wall surface increasing in diameter from the opposite ends of said sleeve member toward the central portion thereof, and at least one slit formed in said sleeve member and extending axially over a distance smaller than the axial length thereof to allow said sleeve member to radially expand and contract, a pair of tubular members each having an outer diameter substantially equal to the inner diameter of said body member and an inner diameter larger than the outer diameter of said sleeve member at the opposite ends thereof and slidable axially of said body member to impart radially inward deformation to said sleeve member in cooperation with the tapered outer wall surface of said sleeve member, and clamping means cooperaive with the respective externally threaded end portions of said body member to urge the tubular terminal members

axially inwardly against said sleeve member for pressure engagement therewith.

3,982,816
METHOD FOR MEASURING THE PARAMETERS OF OPTICAL FIBERS

Laurence Shrapnell Watkins, Hopewell Township, Mercer County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed June 21, 1974, Ser. No. 482,707
Int. Cl.² G01N 21/00; G01B 9/02, 11/04
U.S. Cl. 356—103 19 Claims



1. A method of measuring the outer diameter of an optical fiber having an inner core and an outer cladding, given the refractive index of the outer cladding, which comprises:

directing a beam of coherent, monochromatic radiation at the fiber to generate a far-field scattering pattern, a portion of the scattering pattern resulting from interference between radiation reflected from the outer surface of the fiber and radiation predominated by light passing through and being refracted by the outer cladding;

counting the number, N, of fringes between a lower scattering angle θ_1 and upper scattering angle θ_2 in said portion of the scattering pattern; and

calculating the outer diameter, d, of the fiber from the relation

$$d = N\lambda/[E(\theta_2) - E(\theta_1)]$$

wherein

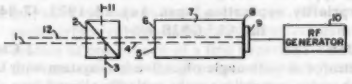
$$E(\theta_1) = \sin(\theta_1/2) + \sqrt{m_1^2 + 1 - 2m_1\cos(\theta_1/2)}$$
$$E(\theta_2) = \sin(\theta_2/2) + \sqrt{m_1^2 + 1 - 2m_1\cos(\theta_2/2)}$$

m_1 = the refractive index of the cladding, and
λ = the wavelength of the radiation.

3,982,817
COLLINEAR ACOUSTO-OPTICAL TUNABLE FILTER AND ACOUSTO-OPTICALLY TUNABLE LASER

John D. Feichtner, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 445,526, Feb. 25, 1974. This application Sept. 30, 1975, Ser. No. 618,100
Int. Cl.² G02F 1/20
U.S. Cl. 350—149 16 Claims



1. An acousto-optical filter comprising:

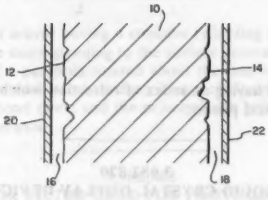
A. a crystal of Tl_3AsSe_3 at least 1 mm wide and at least 1 mm long having at least one optical face and an optical path passing through said crystal and entering said crystal through said optical face; and

B. means for generating a longitudinal sound wave in said crystal which moves collinear with at least part of said path.

3,982,818
OPTICAL DEVICE WITH LIQUID COATING

Peter E. Oettinger, Acton, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.

Filed Dec. 30, 1974, Ser. No. 537,483
Int. Cl.² G02B 1/02
U.S. Cl. 350—157 10 Claims



1. An optical device comprising, in combination:

A. a passive crystal having an entrance face through which incident radiation propagates to the interior region of said crystal, an exit face through which light incident thereon from said interior region propagates to region exterior to said crystal, and an interior region characterized by at least two different principal indices of refraction, each of said principal indices of refraction differing from the index of refraction of the medium exterior to said crystal, and

B. means for reducing the electric field near at least one of said faces induced by radiation incident on said face, said means including an optical flat adjacent to said face and a liquid coating between said optical flat and said face, said liquid coating being characterized by an index of refraction such that the magnitude of the difference between said index of refraction of said liquid coating and at least one of said principal indices of refraction is less than the magnitude of the difference between said index of refraction of said medium and any one of said principal indices of refraction.

3,982,819
FLUID GAP GLAN-LASER PRISM

Jules P. Letellier, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 22, 1975, Ser. No. 580,130
Int. Cl.² G02B 1/02, 5/04
U.S. Cl. 350—157 3 Claims

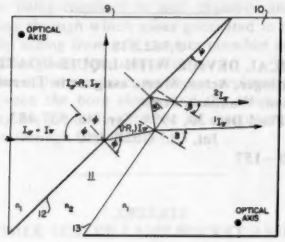
1. A Glan-laser prism polarizer which comprises:

first and second prisms made of a biregringent material positioned with end faces parallel with each other and with sloping faces adjacent each other with their optical axes parallel

said sloping faces having a different slope and meeting at one edge to form an angular gap between said prisms with the apex of said angular gap at the point at which said faces meet,

said first and second prisms being immersed in a fluorinated

liquid with said liquid filling said angular gap therebetween, and



said liquid having an index of refraction which is less than that of said prisms.

3,982,820

LIQUID CRYSTAL DISPLAY DEVICE

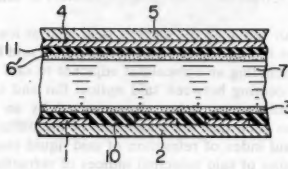
Katsuji Hattori, Uji; Masakazu Fukai, Nishinomiya; Akio Moriyama, Katano, and Yasuhiro Nishizawa, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 26, 1975, Ser. No. 607,940

Claims priority, application Japan, Aug. 29, 1974, 49-99662

Int. Cl.² G02F *1/13*

U.S. Cl. 350—160 LC **4 Claims**



1. A liquid crystal display device comprising a pair of transparent substrates, transparent conductive films formed on inner surfaces of the substrates, coating layers of boron nitride with hexagonal crystal structure, formed on inner surfaces of said substrates and said conductive films, and a liquid crystal material interposed between said coating layers.

3,982,821

MICROSCOPE OBJECTIVES

Arthur H. Shoemaker, East Aurora, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed Apr. 26, 1974, Ser. No. 464,385

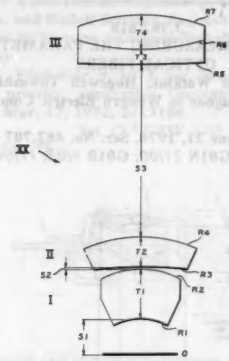
Int. Cl.² G02B *9/34*, *21/02*

U.S. Cl. 350—175 ML **12 Claims**

1. A microscope objective having a numerical aperture of about 0.25 which comprises, in alignment from an object plane along an optical axis,

a concavo-convex positive singlet as a first element,

a concavo-convex positive singlet as a second element, and a positive doublet as another element, said positive doublet



being the sole doublet of said objective and having as the second component thereof a double convex lens.

3,982,822

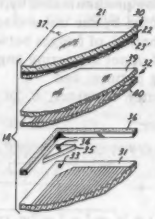
COMPOSITE FRESNEL LENS ASSEMBLY

Terrence M. Conder, Stillwater, and Donald J. Newman, White Bear Lake Township, Ramsey County, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 3, 1975, Ser. No. 554,417

Int. Cl.² G02B *3/08*; G03B *21/14*; B32B *17/00*

U.S. Cl. 350—211 **10 Claims**



1. A large area optical element comprising a plastic lens element having an incremental lens surface and bonded over the opposite surface to a glass plate through an intervening bonding film of plasticized polyvinyl butyral, and wherein said glass plate, bonding film and plastic panel have relative thicknesses respectively of about 10:1.5–2.5:2.0–3.0.

3,982,823

RETROFOCUS WIDE-ANGLE OBJECTIVE LENS SYSTEM OF LARGE RELATIVE APERTURE

Kikuo Momiyama, Chofo, and Yujiro Agari, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 387,038, Aug. 9, 1973, abandoned.

This application June 13, 1975, Ser. No. 586,550

Claims priority, application Japan, Aug. 23, 1972, 47-84315

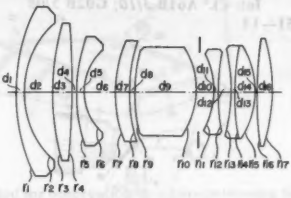
Int. Cl.² G02B *9/64*

U.S. Cl. 350—214 **3 Claims**

1. A retrofocus wide-angle objective lens system with large relative aperture comprising eight optically aligned lens components of which the first component is a concave meniscus lens of rearward concavity, the second component is a convex lens, the third component is a concave meniscus lens of rearward concavity, the fourth component is a convex lens of

strong forward convexity, the fifth component is a convex lens of strong rearward convexity, the sixth component is a bi-concave lens, the seventh component is a convex meniscus doublet consisting of a concave lens and a convex lens cemented together and the eighth component is a bi-convex lens, and having a diaphragm interposed between the fifth and sixth components, and said objective lens system being characterized by the following relationships in combination:

$$0.4f<d_7+d_8+d_9<0.75f \quad (1)$$



$$0.68 < \frac{r_{13}}{r_{12}} < 1.75,\ r_{13} < 0 \quad (2)$$

$$0.05f<d_{12}<0.105f \quad (3)$$

$$1.73<(N_8+N_9)/2 \quad (4)$$

$$\nu_4<35 \quad (5)$$

$$2.5<\nu_6-\nu_7<17 \quad (6)$$

wherein f is the equivalent focal length of the entire lens system, d_7 is the axial thickness of the fourth component, d_8 is the axial air separation between the fourth and fifth components, d_9 is the axial thickness of the fifth component, r_{12} is the radius of curvature of the rear refracting surface of the sixth component, r_{13} is the radius of curvature of the front refracting surface of the seventh component, d_{12} is the axial air separation between the sixth and seventh components, N_8 is the refractive index of the convex lens of the seventh doublet lens component for the sodium d-line of the spectrum, N_9 is the refractive index of the eighth convex lens component for the sodium d-line of the spectrum, ν_4 is the Abbe number of the fourth convex lens component, ν_6 is the Abbe number of the sixth bi-concave lens component, and ν_7 is the Abbe number of the concave lens of the seventh doublet lens component.

3,982,824
CATOPTRIC LENS ARRANGEMENT

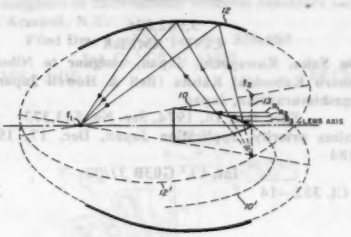
Werner R. Rambauske, Carlisle, Mass., assignor to Raytheon Company, Lexinton, Mass.

Continuation-in-part of Ser. No. 203,684, Dec. 1, 1971, abandoned. This application Apr. 17, 1972, Ser. No. 244,393
Int. Cl.² G02B 5/10
U.S. Cl. 350—294 **17 Claims**

1. A catoptric lens arrangement for converting a diverging beam of wave-propagated energy from a source thereof into a collimated beam, the axes of both such beams being coincident with a lens axis, such arrangement comprising:

a. an entrance mirror having a convex reflecting surface, such surface corresponding to the surface generated by a section of one branch of a first hyperbola nutated around the lens axis, one focal point of such hyperbola being coincident with the source and the other focal point describing a first circle about the lens axis;

b. a secondary mirror having a convex reflecting surface, such surface corresponding to the surface generated by a section of one branch of a second hyperbola nutated around the lens axis, one focal point of such hyperbola describing a circle coincident with the first circle and the other focal point describing a second circle about the lens axis; and,

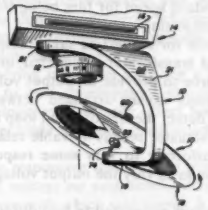


c. an exit mirror having a concave reflecting surface, such surface corresponding to the surface generated by a section of a parabola rotated about the lens axis, the focal point of such parabola describing a circle coincident with the second circle and the principal axis being parallel to the lens axis.

3,982,825
COLOR FILTER HEAD FOR PHOTOGRAPHIC ENLARGERS

Robert W. Mitchell, St. Joseph, Mich., assignor to Photo Systems, Inc., Dexter, Mich.

Filed Oct. 15, 1974, Ser. No. 514,632
Int. Cl.² G03B 27/76; G02B 5/20
U.S. Cl. 350—313 **20 Claims**



1. A filter assembly for modifying generally collimated light from a light source, said assembly comprising:

generally planar base means having a central hub portion defining a rotational base bearing and apertured portions radially spaced from said hub portion and extending circumferentially relative to said hub portion,

yoke support means comprising a first leg having a support bearing cooperating with said base bearing to rotatably support said base means and a second leg having mounting means to secure said assembly to said light source with the axis of said collimated light transversely intersecting said base radially outward from said hub,

light filter means overlying at least some of said apertured portions, said apertured portions lying on a circumference of said base which intersects said axis,

said filter means and said axis of collimated light intersecting at an acute angle,

carrier means rotatably mounted on said base for rotation about said hub, said filter means being mounted on said carrier means,

said base, said carrier and said filter means always being balanced about said rotational base bearing, and

manually engageable means for rotating said base, said carrier and said filter means on said bearings with said

apertured portions of said base and said filter means passing through said axis to provide a predetermined integrated effective filtered light output from said light source.

3,982,826

CINE CAMERA

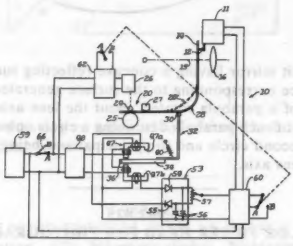
Fumio Saito, Kawaguchi, Japan, assignor to Nihon Beru-Haueru Kabushiki Kaisha (Bell & Howell Japan, Ltd.), Higashimurayama, Japan

Filed Dec. 16, 1974, Ser. No. 533,373

Claims priority, application Japan, Dec. 17, 1973, 48-142184

Int. Cl.² G03B 31/00

U.S. Cl. 352—14 3 Claims



1. A motion picture camera for exposing silent film and sound film having a track on which sound can be recorded, the silent film and the sound film being enclosed in distinguishable cassettes, the camera having an intermittent film transporting device for moving film through a sound station, the camera including means for controlling the rate of film transport to maintain a standard speed for film being transported through said camera comprising:

a power source for energizing said transporting devices;

a differential transformer connected in circuit with said power source to provide an output voltage;

film loop sensor means arranged between said transport devices to detect the size of a film loop therebetween, and including actuator means movable relative to said differential transformer to vary same responsive to the film loop size so as to vary the output voltage from said transformer;

a rectifier circuit connected to said differential transformer for rectifying the output voltage from said differential transformer as said voltage varies from zero when said actuator means is displaced from a position corresponding to an orientation with the film loop being a standard sized loop, said actuator means being displaceable from said position by variations in loop size thereby causing the output voltage of said rectifier circuit through said differential transformer to be modified proportionally;

a control circuit connected to said intermittent film transporting device for varying said device responsive to variations in said rectified output voltage from said rectifier whereby the rate of operation of said intermittent film transporting device is modified to feed film at a rate to re-establish said film loop at said standard size, said differential transformer increasing the rate of operation of said intermittent film transporting device when said sensor detects a decreasing film loop size, and decreasing the rate of operation of said device when an increasing film loop size is detected;

a high frequency oscillator connected in circuit between said power supply and said differential transformer providing an input voltage for exciting said differential transformer; and

switch means actuated by said respective cassettes when said cassette is in said camera, said switch means deactivating electrically said high frequency oscillator and said constant film transporting device when the film cassette in the camera is detected as containing silent film.

3,982,827

OPTHALMIC INSTRUMENT

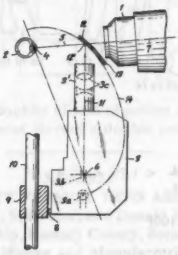
Paul Frédéric Marie Gambs, Chemin du Petit Bois, Ecully (Rhone), France

Filed Mar. 18, 1975, Ser. No. 559,419

Claims priority, application France, Mar. 20, 1974, 74.10418

Int. Cl.² A61B 3/10; G02B 5/08

U.S. Cl. 351—14 6 Claims



1. An ophthalmic instrument comprising:

a biomicroscope having an optical axis trainable upon a selected zone of a patient's eye;

a light source forming a narrow beam for illuminating said zone, said source being swingable about a pivotal axis skew to said optical axis; and

a plurality of flat mirror sections closely juxtaposed with one another and including different angles with said optical axis in a swing plane transverse to said pivotal axis for reflecting said beam from different directions upon a predetermined observation point in line with said optical axis, each of said sections being tangent to an ellipse in said swing plane having a first focus on said pivotal axis and a second focus coinciding with said observation point.

3,982,828

EYE TESTING APPARATUS

Bernard Nathan Woolf, Muizenberg, South Africa, assignor to South African Inventions Development Corporation, Pretoria, South Africa

Filed Aug. 7, 1975, Ser. No. 602,675

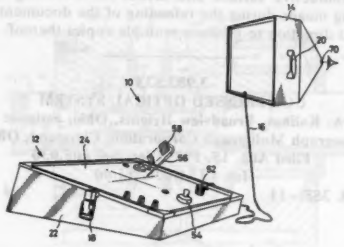
Claims priority, application South Africa, Aug. 8, 1974, 74/5063

Int. Cl.² A61B 3/02

U.S. Cl. 351—23 12 Claims

1. An eye testing apparatus including a control unit having a control display panel having a number of distributed electrical lights adapted to be illuminated; an electrical connection means for connecting the control unit to a source of electrical energy; a remote scanner unit adapted to be electrically connected to the control unit, and including a scanner display panel provided with electrical lights, positioned corresponding to the lights on the control display panel, and which are adapted to be illuminated corresponding to the illumination of the lights on the control display panel, the scanner display panel also having a fixing light; and operation means for caus-

ing any one or more lights on the control display panel and the corresponding light or lights on the scanner display panel to



be illuminated for observation by a person viewing the scanner display panel.

3,982,829

EXPOSURE MEANS FOR PHOTOCOPYING APPARATUS

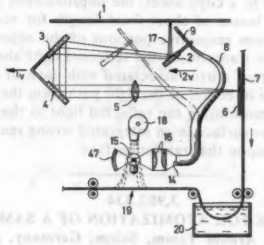
Heimo Hirth, Frankfurt am Main, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 18, 1974, Ser. No. 524,894

Claims priority, application Germany, Nov. 19, 1973, 2357721

Int. Cl.² G03B 27/00

U.S. Cl. 355—1 **10 Claims**



1. In a photocopying apparatus including means for progressively optically scanning an object in a strip-like manner in synchronism with the travel of a light-sensitive medium and for projecting on said medium an image of the scanned portion of said object; the improvement which comprises exposure means for illuminating the scanned strip portion of said object, comprising

a. at least one flexible bundle of light conducting rods the light outlet ends of which terminate adjacent the object in at least one narrow zone which extends normal to the direction of scanning of said scanned object, the length of said zone corresponding with the width of the object, the light inlet ends of said rods being combined in the form of a bundle having a circular cross-sectional configuration terminating in an inlet end surface; and

b. means including a light source for illuminating the light input ends of said rods, said light source being adjacent said bundle inlet end surface and the illuminating surface of said light source corresponding with said bundle cross-section, whereby uniform illumination of said object is achieved.

3,982,830

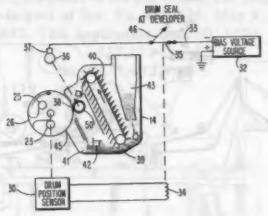
MAGNETIC BEAD CARRYOUT REDUCTION BY ALTERING THE DEVELOPER'S BIAS VOLTAGE

Raymond A. Daniels, and Arthur H. Knight, both of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 6, 1974, Ser. No. 530,468

Int. Cl.² G03G 15/09

U.S. Cl. 355—3 DD **10 Claims**



1. An electrophotographic machine, comprising:

a rotatable drum having at least one axial slot in the surface thereof,

an incrementing photoconductor contained within said drum, having a portion thereof emanating from a drum slot to encircle a portion of said drum, and returning to the interior of said drum through a drum slot,

means operable during drum rotation to charge said photoconductor portion to one polarity,

illumination means thereafter operable during drum rotation to selectively discharge said photoconductor portion to provide a latent electrostatic image thereon, and

an electrophotographic development unit, including:

a developer mix comprising carrier charged to said one polarity and toner charged to an opposite polarity,

development electrode means,

bias voltage applying means for applying a voltage of said one polarity to said development electrode means to create a development electrode effect between said development electrode and said photoconductor portion; and

switching means responsive to the drum position operable to change the voltage on said development electrode to reduce the force with which said carrier is presented to a drum slot as it passes said development electrode.

3,982,831

ELECTROSTATOGRAPHIC REPRODUCTION APPARATUS AND DRIVE THEREFOR

William Kingsley, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed June 30, 1975, Ser. No. 592,004

Int. Cl.² G03G 15/04

U.S. Cl. 355—5 **24 Claims**

14. Automatic electrostatographic reproduction apparatus of the kind in which, during operation, a photoconductive member is moved past a series of processing stations and during imaging a carrier for the image sought to be reproduced is moved in synchronism with the member, the improvement comprising a scanning drive for the image carrier comprising

a carriage for the image carrier supported for reciprocating movement,

cam means,

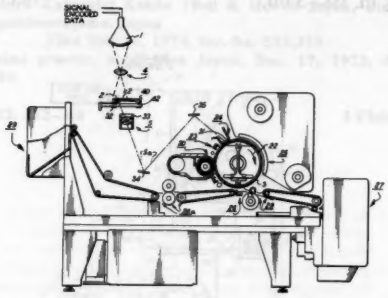
means for moving said cam synchronously with said photoconductive member,

a cam follower drivingly connected to said carriage for controlling movement thereof in response to movement of the cam means, whereby movement of the carriage in

at least one direction is synchronized with the movement of the photoconductive member,

first biasing means urging said cam follower against said cam means,

second biasing means of lesser strength than said first biasing means urging said cam follower out of engagement with said cam means,



and means for deactivating said first biasing means to permit said second biasing means to disengage said cam follower from the cam means whereby the carriage may be rendered stationary without interrupting the movement of the photoconductive member.

3,982,832

ELECTROSTATOGRAPHIC COPYING MACHINES

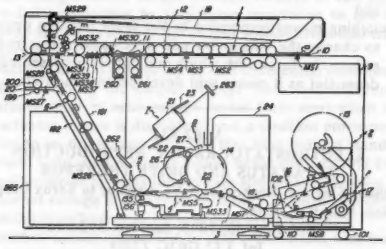
Dennis M. Bendall, Coleford, and Peter M. Thorp, Lydbrook, both of England, assignors to Rank Xerox Ltd., London, England

Continuation of Ser. No. 371,455, June 19, 1973, abandoned. This application Nov. 7, 1974, Ser. No. 521,701

Claims priority, application United Kingdom, June 23, 1972, 29648/72

Int. Cl.² G03G *15/30*

U.S. Cl. 355—8 **2 Claims**



2. In a electrostatographic copying machine comprising means for continuously advancing a reusable photoconductive member past processing stations including corotron means for charging the surface thereof, means for feeding a document in a forward direction over an exposure slit in order to produce a first copy of said document, means for reversing and refeeding the document over the exposure slit in order to produce second and subsequent copies of the document, means for projecting an image of the document at the slit onto the surface of the continuously moving reusable photoconductive member which is adapted to be driven at a speed related to the speed of said document as it is fed over the exposure slit to enable a latent electrostatic image to be formed thereon during forward feeding of the document, means for developing and transferring the developed image to copy sheet, and means for cleaning the residual photoconductive surface the improvement comprising means for switching off said charging means during reversal of said document over the exposure slit and projection of a backwards image thereof to prevent development of the image and avoid cleaning of the reusable photoconductive surface and means for switching on said charging means during the refeeding of the document in the forward direction to produce multiple copies thereof.

3,982,833

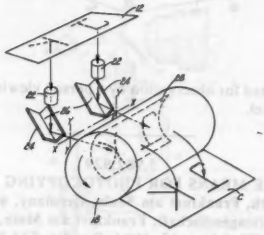
COMPRESSED OPTICAL SYSTEM

James A. Kolibas, Broadview Heights, Ohio, assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Aug. 15, 1975, Ser. No. 605,030

Int. Cl.² G03G *15/00*

U.S. Cl. 355—11 **4 Claims**



1. In an electrostatic copier of the type having an illuminated object plane at which a moving document is scanned, and light reflected from the object plane is transmitted to a moving photoconductive transfer surface to produce an image of the document thereon and the transfer surface then transfers the image to a copy sheet, the improvement comprising a plurality of lenses of short focal length for receiving reflected light from respective portions of the object plane in parallel and for transmitting the reflected light along parallel light paths, a roof mirror associated with each of said lenses for altering the direction of the light path from the respective lens and for transmitting the reflected light to the photoconductive transfer surface in an integrated wrong reading orientation as cast upon the transfer surface.

3,982,834

DEVICE FOR ATOMIZATION OF A SAMPLE

Rolf Günther Arnold Tamm, Salem, Germany, assignor to Bodenseewerk Perkin-Elmer & Co. GmbH, Uberlingen, Germany

Continuation of Ser. No. 561,285, March 24, 1975, abandoned. This application Aug. 28, 1975, Ser. No. 608,514

Claims priority, application Germany, Mar. 22, 1974, 2413781

Int. Cl.² G01J *3/30*; G01N *21/16*

U.S. Cl. 356—85 **6 Claims**

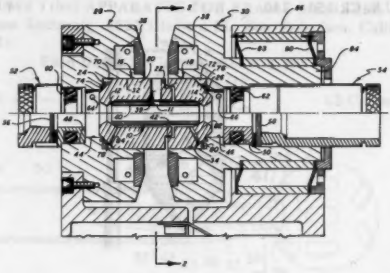
1. A device for flameless atomization of a sample for atomic absorption analysis, comprising:

a. a hollow body of electrically conductive material defining a sample chamber having a radiation-transmissive passage therethrough;

b. electrode means in electrical contact with said body at spaced locations for passing an electrical current through the body to cause heating thereof, at least a portion of said electrode means having an external surface the cross-section of which is of constant configuration and dimension; and

c. cooling jacket means for said electrode means including an internal surface having a cross-section complementary to the cross-section of the external surface of said electrode means, the cross-sectional dimension of said inter-

nal surface being such, in relation to the dimension of the cross-section of the external surface of said electrode means, as to enable insertion of the electrode means into said cooling jacket means at room temperature and to



cause an increase in contact pressure between the internal surface of said cooling jacket means and external surface of said electrode means due to differing thermal expansion of the electrode and cooling jacket means during operation of the device.

3,982,835

INTERFEROMETRIC SYSTEM

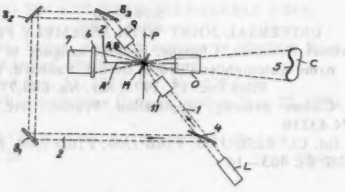
Otto Schwomma, Schwechat, Austria, assignor to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Filed Sept. 3, 1974, Ser. No. 502,750

Claims priority, application Austria, Sept. 4, 1973, 7655/73; Sept. 14, 1973, 7953/73; Sept. 4, 1973, 7656/73

Int. Cl.² G01B *9/02*

U.S. Cl. 356—106 R **13 Claims**



1. A holographic-interferometric system for analyzing changes in the condition of an object having a diffusely reflecting surface, comprising:

evaluating means provided with a receiving surface;

a source of coherent light forming an illuminating beam and a reference beam;

first optical means in the path of said illuminating beam defining a point of divergence between said source and said object;

reflecting means arranged at a first location substantially coinciding with said point of divergence for directing said illuminating beam onto said object, said reflecting means having a highly reflective region;

second optical means in the path of light rays reflected by said object for forming an image of said object on said receiving surface, said second optical means having an aperture stop with an opening and imaging said point of divergence and said highly reflective region at a second location substantially coinciding with the center of said opening, the image of said highly reflective region being smaller than said opening; and

third optical means in the path of said reference beam for directing said reference beam onto said receiving surface for forming a field of interference between said reflected rays and said reference beam;

said evaluating means including means for storing and superposing holograms corresponding to different conditions of said object.

3,982,836

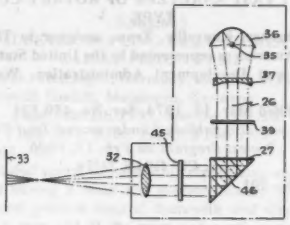
METHOD AND MEANS FOR ENHANCING PRINTS FOR DIRECT COMPARISON

Harold Green, Los Angeles, and Stephen J. Halasz, Claremont, both of Calif., assignors to Harold Green, Los Angeles, Calif.

Continuation-in-part of Ser. No. 468,425, May 9, 1974, Pat. No. 3,928,842. This application Dec. 30, 1974, Ser. No. 537,112

Int. Cl.² G01J *4/00*

U.S. Cl. 356—119 **12 Claims**



1. A method for enhancing fingerprints comprising the steps of:

impressing the features of a fingerprint in the surface of a transparent pressure sensitive gel;

passing a collimated beam of polarized light through said gel;

directing the portion of said light beam emitted by said gel through a polarized light filter; and

projecting the portion of said light beam emitted by said filter to produce an illuminated image of said fingerprint in an image plane.

3,982,837

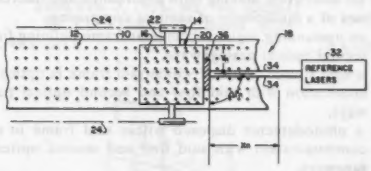
METHOD AND APPARATUS FOR CALIBRATING RESEAU GRIDS

James B. Cummins, Silver Spring, Md., assignor to Controlled Environment Systems, Inc., Rockville, Md.

Filed Jan. 24, 1975, Ser. No. 543,957

Int. Cl.² G01B *11/14*

U.S. Cl. 356—168 **10 Claims**



1. A method for calibrating elongate large grids having a plurality of points in a repeating grid pattern wherein the points have errors in their location in the grid pattern, said method comprising the steps of:

superimposing on the large grid a smaller calibrated grid having the same grid pattern as the large grid wherein the points on the calibrated grid are precisely located, and the actual location of the points is accurately known, and orienting the calibrated grid pattern in the same orientation as the large grid pattern;

comparing the location of the points on said superimposed calibrated grid with the location of the points on the large grid;

translating said calibrated grid a known distance and superimposing said grid pattern of said calibrated grid on a different part of the grid pattern of the large grid;

determining the exact amount of translation and rotation of said translated calibrated grid;

comparing the location of said points on the superimposed calibrated grid in the translated position with the location of the points on the large grid for obtaining error displacement differentials of the points on the large grid; and

repeating the translating, determining and comparing steps until all of the points on the large grid have been calibrated.

3,982,838

COMPACT FAST ANALYZER OF ROTARY CUVETTE TYPE

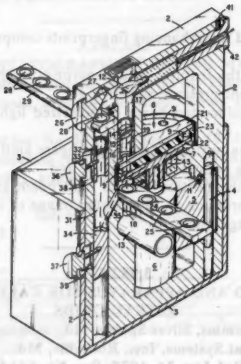
Louis H. Thacker, Knoxville, Tenn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Mar. 12, 1974, Ser. No. 450,521

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.[2] G01N 21/24

U.S. Cl. 356—201 **5 Claims**



1. A compact fast analyzer of the rotary cuvette type suitable for selectively making both absorbance and fluorescence analyses of a multiplicity of samples comprising:

a. an upstanding, rigid, rectangular frame defining first and second optical passageways;

b. a light source disposed within said frame in optical communication with said first and second optical passageways;

c. a photodetector disposed within said frame in optical communication with said first and second optical passageways;

d. a motor-driven rotor mount pivotally attached to said frame, said rotor mount being selectively movable to an operating position intermediate said light source and photodetector and in optical communication with said first and second optical passageways and to a rotor loading position displaced from said operating position;

e. a cuvette rotor defining a circular array of sample analysis cuvettes removably disposed on said rotor mount and rotatable therewith; and

f. means for selectively blocking light passage through said first and second optical passageways.

3,982,839

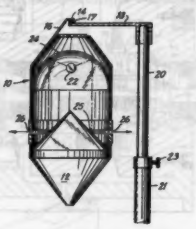
APPARATUS FOR POSITIONING AN ARTICLE ON A WALL

Morton Schwartz, 54 Shirley Lane, White Plains, N.Y. 10607

Filed Mar. 21, 1975, Ser. No. 560,725

Int. Cl.[2] G01C 9/12, 9/16

U.S. Cl. 356—250 **4 Claims**



1. An apparatus for projecting a directionally oriented light beam onto the walls of a room, said light beam providing a reference line for positioning an article on one of said walls, said apparatus comprising:

a. a vertically adjustable support member;

b. a weighted enclosure vertically suspended from said support member;

c. a light source mounted within said enclosure;

d. means defining a slit in the wall of said enclosure, said slit extending in a horizontal plane and extending substantially entirely around said enclosure; and

e. means for reflecting light from said light source outwardly through said slit whereby, when said enclosure is suspended from said support member and is positioned within a room and said light source is activated, a horizontal light beam is projected onto the walls of said room and may be utilized when positioning an article on a wall.

3,982,840

UNIVERSAL JOINT WITH ASSEMBLY FEATURE

Albert Grosseau, Chaville, France, assignor to Societe Anonyme Automobiles Citroen, Berliet, Panhard, France

Filed Dec. 15, 1975, Ser. No. 640,779

Claims priority, application France, Dec. 19, 1974, 74.43210

Int. Cl.[2] B25G 3/00; F16B 1/00; F16D 1/00; F16G 11/00

U.S. Cl. 403—14 **2 Claims**

1. In a universal joint,

an external cup-like element,

an internal element located within the external element,

means defining three pairs of opposed grooves formed respectively, in the external and internal elements, said grooves being generally or toroidal form,

a spheroidal guide cage having slots,

three balls each located in a respective one of the slots and engaged in a respective one of the pairs of grooves, and

means defining a further groove in the external element, said further groove being spaced from one of said opposed grooves to define therebetween a bearing surface, the width of which is less than that of one of said slots

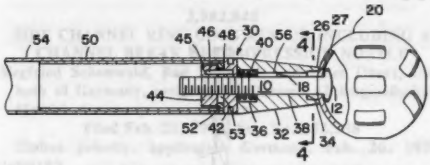
whereby the bearing surface can be introduced into a said slot by a sufficient distance to permit introduction of the cage into the external element.

3,982,841

CONNECTING APPARATUS FOR FRAME MEMBERS

Abraham Endzweig, 2822 Clement St., San Francisco, Calif. 94121

Filed Dec. 8, 1975, Ser. No. 638,395
Int. Cl.² F16B 17/18
U.S. Cl. 403—19 12 Claims



1. An improved frame connector adapted to removably join an elongate frame section to a second member comprising:

sleeve means adapted to be disengageably connected to an end of the frame section and having internally threaded means rotatably held captive therein;

a collar having a through bore axially disposed therein;

threaded bolt means in the through bore and threaded in the internally threaded means, said bolt means including an enlarged head member;

said second member having an aperture adapted to removably receive the head member in engaging relation; and

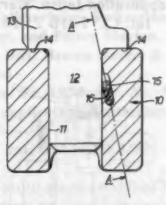
biasing means axially intermediate the collar and one end of the sleeve means for biasing the collar towards the head member to hold the head member in engaging relation with the aperture.

3,982,842

COUPLING SOCKET WITH RELEASABLE TOOL RETAINER

Dennis Denman, Sutton, England, assignor to Matthias Spencer & Sons Limited, Sheffield, England

Filed Nov. 27, 1974, Ser. No. 527,859
Claims priority, application United Kingdom, Nov. 27, 1973, 55058/73
Int. Cl.² B25G 3/00; E21B 19/16; F16D 1/00
U.S. Cl. 403—20 6 Claims



1. The combination of a male member and a female member wherein the female member has a bore within which the male member can be held and in which a wall of the bore of the female member is so formed that, when the male member is fitted in the bore, at least a portion of the wall of the bore of the female member is inclined at an acute angle relative to a cooperative surface of the male member, a rolling location element being located between said wall of the female member and said surface of the male member with resilient biasing means engaging the rolling location element and wedging it into an operative position in which, if any attempt is made to remove the male member from the bore of the female member, the wedging action obtained between the wall of the female member, the surface of the male member and the rolling location element will be increased to prevent removal of the male member from the bore of the female member, manually operable release means being provided for effecting displacement of the rolling location element against the action of the resilient biasing means to permit uncoupling of the male and female members, said rolling location element comprising a sphere and the manually operable release means comprising a pin movable within a passage which extends transversely of the bore of the female member, which pin is formed with a recessed portion to receive the rolling location element when said location element is in its operative position and the pin being movable to displace the recess thereof relative to the rolling location element and hence move the location element out of its operative position.

3,982,843

PISTON-SLEEVE COUPLING ARRANGEMENTS FOR A RADIAL PISTON PUMP

Thomas Sirek, Metzingen, Germany, assignor to Firma Wepuko-Hydraulik GmbH, Metzingen, Germany

Filed Feb. 20, 1975, Ser. No. 551,155
Int. Cl.² F16B 7/10; F16C 11/00; F16D 1/12; F16J 1/14
U.S. Cl. 403—53 4 Claims

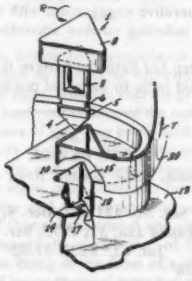
1. In a radial pump sub-assembly comprising an elongated, piston rod having a main rod portion fixedly coupled to a spherical end portion coaxial therewith and disposed rearwardly of a rear end of the main rod portion, the spherical piston being received within a fixed mating spherical recess of a piston having an integral sleeve member mounted for rotational movement and oscillation with respect to the spherical section, the improvement wherein (a) the spherical portion is smaller than a hemisphere and terminates forwardly in a front boundary surface whose diameter is larger than the diameter of the main portion of the piston rod, and wherein (b) the sleeve member includes a peripheral region surrounding and extending forwardly of the spherical recess and having a pair of preformed, diametrically opposed portions projecting inwardly from the remainder of the peripheral region to define a plane of oscillation of the sleeve member with respect to the spherical end portion, the inwardly projecting portions confronting and forwardly overlapping the front boundary surface of the spherical portion to removably capture the spherical section.

3,982,844

TAPE FASTENING SYSTEM

Nicholas De Anda, Redondo Beach, and Robert Ford Dyer, Rancho Palos Verdes, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Feb. 3, 1976, Ser. No. 655,022
Int. Cl.² F16B 11/00; B65H 75/28
U.S. Cl. 403—211 6 Claims



1. Apparatus for attaching flexible tape to a part comprising:

a trilaterally symmetric retainer having an axis of symmetry and having disposed from one end of said axis to the other:

a first portion defining a tapered lead;

a second portion of constant cross-section;

a third portion of constant cross-section having a smaller cross-section than that of said second portion;

a fourth portion of constant cross-section having essentially the same cross-section as said second portion; and

a fifth portion defining a head having a cross-section larger than said first portion;

a flexible tape; and

an aperture for receiving said retainer defined on said part and having an upper plane and an opening having a first portion of substantially constant cross-section extending downward from said upper plane with a cutaway portion extending downward from said plane along a relatively small portion of the circumference of said opening for the introduction of said tape.

3,982,845

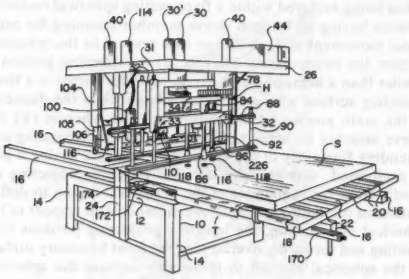
APPARATUS FOR PREPARING FURNITURE BACKS AND CUSHIONS FOR TUFTING

Benjamin F. Dockery, P.O. Box 452, High Point, N.C. 27261, and Jack H. Mason, 1822 Pershing St., High Point, N.C. 27260

Division of Ser. No. 259,196, June 2, 1972, Pat. No. 3,832,083. This application June 28, 1974, Ser. No. 484,074

Int. Cl.² B23B *35/00*

U.S. Cl. 408—1 R **4 Claims**



1. A method for automatically forming holes entirely through and slots partially through the thickness of foam rubber slabs for subsequent use in upholstered cushions for furniture seats and backs according to a prescribed pattern, comprising the steps of:

a. positioning a slab to be formed on a horizontally reciprocal table;

b. indexing said table past a vertically reciprocal operating head;

c. moving selected rotary cutting tools and side slot sawing tools into operative engagement with said slab at the end of selected indexing strokes according to a prescribed sequence;

d. repeating step (c) until the pattern is formed; and

e. returning said table to its initial position.

3,982,846

TOOL DEVICE

Ralph L. Steinbach, 2347 Gaston Ave., White Bear Lake, Minn. 55110

Continuation of Ser. No. 421,922, Dec. 5, 1973, abandoned. This application Jan. 31, 1975, Ser. No. 545,981

Int. Cl.² B23B *51/02*

U.S. Cl. 408—226 **2 Claims**

1. A tool device comprising a rotary chuck, said chuck having three similar pointed clamping jaws symmetrically disposed about the longitudinal axis of said chuck and clamping means for moving said jaws together towards said longitudinal axis, the walls of each jaw being disposed at an angle of 120° with respect to each other so that when said jaws are brought together they collectively form a solid cylinder, and a torsion tool secured in said chuck and having a tool portion at one end and a cylindrical shank portion at its other end, said cylindrical shank portion being disposed in said chuck coaxially therewith between said jaws and clamped thereby, said shank portion having a basically uniform circular cylindrical cross-section and two flanges projecting outwardly therefrom opposite to each other, the effective width of the flanges between the cylindrical shank and the portions of the flange engaged by the adjacent jaw being

$$(\sqrt{3}-1)R-\sqrt{\frac{3}{2}}\,t$$

where R is the radius of the cylindrical portion of the shank and t is the thickness of the flange at the jaw engaging portion most widely spaced from the shank so that upon normal hand tightening of said clamping means two of the jaws firmly engage the two flanges while all three jaws tend to engage the cylindrical shank portion.

3,982,847

APPARATUS FOR LOCKING GUIDE VANES OF WATER WHEEL TURBINES OR PUMPS

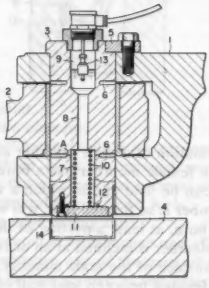
Yozo Kawase, Machida, and Yoshiyasu Mitsuhashi, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha (also known as Tokyo Shibaura Elec. Co., Ltd.), Japan

Filed Mar. 4, 1975, Ser. No. 555,096

Claims priority, application Japan, Mar. 8, 1974, 49-26252

Int. Cl.² F01B *25/26*

U.S. Cl. 415—9 **9 Claims**



1. Apparatus for locking a guide vane to a cover of a hydraulic turbine or pump, comprising:

a guide vane;
a guide vane arm coupled to said guide vane for controlling movement of said vane;
linkage means coupled to a guide ring;
a fracturable member coupling said guide vane arm to said linkage means; and
a hydraulic turbine or pump cover having at least one recess in vertical alignment with said fracturable member for receiving a portion of said fracturable member upon fracture thereof to lock said guide vane arm to said cover to thereby prevent relative movement between said arm and said cover.

3,982,848

SIDE CHANNEL RING COMPRESSOR INCLUDING A CHANNEL BREAK DECOMPRESSION NOZZLE

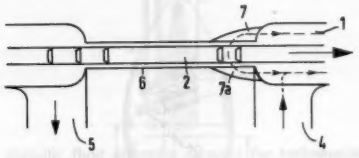
Siegfried Schonwald, Bad Neustadt, and Peter Obert, Ulm, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 25, 1975, Ser. No. 552,938

Claims priority, application Germany, Feb. 26, 1974, 2409183

Int. Cl.² F04D 5/00

U.S. Cl. 415—53 T **3 Claims**



1. In a side-channel ring compressor including an impeller having radially outwardly extending blades, compressor medium inlet and outlet openings communicative with the side channel of said compressor, and a channel break disposed between said inlet and outlet openings, the improvement comprising at least one pocket-like decompression nozzle disposed in said side channel break between said compressor medium inlet and outlet openings and opening directly into said side channel on one of the sides thereof near said compressor medium inlet opening for exhausting compressed compressor medium from between said impeller blades in said channel break and directing said exhausted medium into said side channel adjacent said impeller.

3,982,849

LOW PRESSURE STEAM TURBINE CONSTRUCTION

Felix Bernasconi, Zollikerberg, Switzerland; Heinz Brünner, Walshut, Germany, and Pierre Meylan, Neuenhof, Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

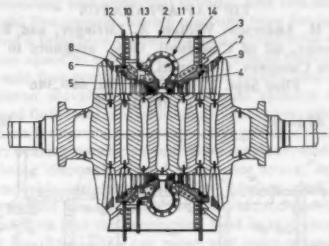
Filed Apr. 23, 1975, Ser. No. 570,629

Claims priority, application Switzerland, Dec. 16, 1974, 16791/74

Int. Cl.² F01D 3/02

U.S. Cl. 415—101 **4 Claims**

1. A low pressure multi-stage axial flow steam turbine comprising an outer housing, an inner housing structure constituting a carrier for the rows of guide blading of the turbine stages, a rotor having rows of blading for receiving steam from the rows of guide blading, an inflow housing comprising at least two separable parts which form the boundaries of a crescent-shaped intake duct surrounding and admitting steam to the first stage guide blading and which flows through the duct in the same direction as the direction of rotor rotation, the cross sectional profile of said crescent-shaped intake duct being constituted by a radially inner portion of rectangular configuration opening in the direction of the first stage guide blading and which merges into a second portion having a circular configuration which progressively decreases in diameter in the direction of steam flow therethrough such that the tangential components of the steam velocity conform to a first predetermined function and wherein the value of the curvature at the



inner periphery of said intake duct increases progressively in the direction of the steam flow therethrough such that the radial components of the steam velocity conform to a second predetermined function.

3,982,850

MATCHING DIFFERENTIAL THERMAL EXPANSIONS OF COMPONENTS IN HEAT ENGINES

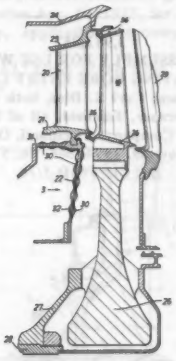
John Jenkinson, Bristol, England, assignor to Rolls-Royce (1971) Limited, Great Britain

Filed June 16, 1975, Ser. No. 587,168

Claims priority, application United Kingdom, June 29, 1974, 28997/74

Int. Cl.² F01D 5/00

U.S. Cl. 415—178 **7 Claims**



1. A heat engine having two components of differing thermal masses disposed in the same environment and which expand at different rates, wherein there is provided insulation over an area of at least one surface of the component of lower thermal mass, the size of said area being such in relation to the thermal conductivity of the insulation, the temperature in the environment, and the rate of thermal expansion of the other component, as to allow only sufficient heat conduction between the insulation and said component as is necessary to reduce the rate of thermal expansion and contraction of said component to substantially match that of the other component, the insulation being in the form of a sheet spaced from said component of lower thermal mass but connected to it at its edges to define an enclosed space and being further connected to said component at a plurality of discrete areas dis-

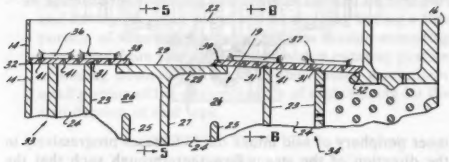
tributed over said insulated area, the number and sizes of the discrete areas being such as to define the required heat conducting paths between the insulation and the component.

3,982,851

TIP CAP APPARATUS

Richard H. Andersen; William A. Litzinger, and Robert J. Corsmeier, all of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Sept. 2, 1975, Ser. No. 609,346
Int. Cl.[2] F01D 5/18
U.S. Cl. 416—92 26 Claims



1. An improved turbomachine blade structure of the type having convex and concave side walls defining a cavity with a radially outer open end and a tip cap which forms the closure for the open end, the cavity having both platform means and retaining means for preventing the cap movement in the radially inward and outward directions, respectively, wherein the improvement comprises:

a. closure means disposed in the cavity at a location radially inward from said retaining means to close a portion of the open end; and

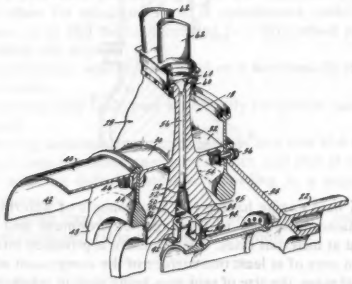
b. a tip cap disposed in the cavity for closing another portion of the open end, the size and shape of said tip cap being such as to allow its insertion between the platform and retaining means by initially placing a portion thereof contiguous with the outer surface of said closure means and then sliding it into the desired position.

3,982,852

BORE VANE ASSEMBLY FOR USE WITH TURBINE DISCS HAVING BORE ENTRY COOLING

Richard H. Andersen; Carl R. Dins, both of Cincinnati, and Frederick C. Herzner, Fairfield, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Nov. 29, 1974, Ser. No. 528,023
Int. Cl.[2] F01D 5/18
U.S. Cl. 416—95 2 Claims



1. A rotor comprising:

two generally parallel annular discs for rotation about a common axis, the inner peripheries of said discs being substantially thicker than the outer peripheries thereof and axially displaced relative to each other;

a plurality of aerodynamically contoured ribs connected between said discs for pumping a cooling fluid radially outwardly, said ribs extending from a point intermediate the inner and outer peripheries, and each rib terminating in a bulbous tenon, adjacent pairs of which each cooperate to retain the root portion of a turbomachinery blade therebetween; and

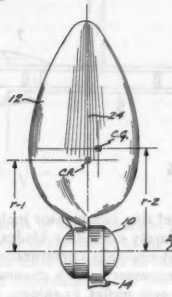
nonintegral, aerodynamically contoured bore vanes inserted between said discs, each vane having its longitudinal axis generally parallel to the disc rotational axis and its chord extending from the disc inner periphery to a location radially inwardly of said ribs thereby partially defining a cavity between said vanes and said ribs, said vanes further contoured to receive the cooling air from the generally radial direction and turn the cooling fluid tangentially into the cavity in substantial alignment with said ribs; the number of bore vanes being less than the number of ribs and sized to provide axial columnar structural support between said discs to substantially reduce compressive stresses in said ribs due to centrifugal forces tending to rotate the thick disc inner peripheries toward each other.

3,982,853

FOLDING BOAT PROPELLER

David Walter Beck, 2257 Gaylord, Long Beach, Calif. 90813

Filed July 23, 1975, Ser. No. 598,370
Int. Cl.[3] B63H 1/24
U.S. Cl. 416—142 6 Claims



1. A reversible folding boat propeller assembly having enhanced capability to open with reverse thrust when the boat is still moving forward through the water, comprising:

a hub that is rotated about a rotational axis in one direction to drive a boat in a forward direction and in a reverse direction to drive a boat in a backward direction, said hub being formed with a blade recess;

a pair of blades;

a pivot pin pivotally connecting the radially inner ends of said blades to said hub within said recess for movement about a pivot axis that intersects and is normal to said rotational axis;

each of said blades pivoting about said pivot axis and automatically moving outwardly and forwardly from a closed folded-together position to an open, driving position when said hub is power-rotated in one direction to drive the boat forward, and said blades automatically moving inwardly and rearwardly to said closed position solely under the influence of water pressure when rotation of said hub is stopped and a boat to which said hub is mounted is moving forward through the water, and when said hub is power-rotated in a reverse direction to either stop a boat's forward movement or to back a boat, each of said blades will readily pivot about said pivot axis and automatically move outwardly and forwardly from a closed folded-together position to an open, driving-position;

each of said blades being so configured and weighted that they offer a minimum drag through the water when in the closed position, but will readily move to an open position, even when a boat is still moving forward through the water with the water pressure biasing said blades to a closed position, when said hub is power-rotated in a

reverse direction because the centrifugal force opening said blade is greater than the hydrodynamic force closing said blades as the center of hydrodynamic force of each blade is positioned radially inwardly of the center of gravity of said blades and closer to the pivot axis than to the outward end of said blades, and with each of said blades having its outer ends narrowed over a significant distance, its outer end thinned and its maximum chord a substantial distance in from the outer ends.

3,982,854

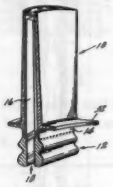
FRICTION WELDED METALLIC TURBOMACHINERY BLADE ELEMENT

Thomas F. Berry, Greenhills; Ronald G. Rajala, Loveland, both of Ohio, and Harold L. Mullins, Hebron, Ky., assignors to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 209,596, Dec. 20, 1971, Pat. No. 3,768,147. This application June 18, 1973, Ser. No. 370,702

Int. Cl. F01d *5/28*

U.S. Cl. 416—213 R **6 Claims**



1. A metallic fluid directing element for turbomachinery apparatus comprising:

an airfoil having a cast alloy structure; and

a base having a wrought alloy structure;

the airfoil and base being joined at a friction welded joint characterized by a solid state, forged structure with a narrow heat affected zone.

3,982,855

RADIAL PISTON PUMP

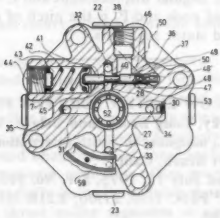
Ulrich Aldinger, deceased, late of Stuttgart, Germany; by Ruth Aldinger, heir, and by Karl Aldinger, heir, both of Stuttgart, Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed May 22, 1975, Ser. No. 579,818

Claims priority, application Germany, May 24, 1974, 2425022

Int. Cl.² F04B *1/04, 49/00*

U.S. Cl. 417—270 **12 Claims**



1. In a pump, particularly in a radial pump, a combination comprising a housing having one cylinder and at least one additional cylinder, a fluid-admitting first port, a first passage connecting said cylinder with said first port and a second port arranged to discharge pressurized fluid and communicatively connected with said cylinders, a piston movable in said one cylinder to thereby draw fluid from said first port via said first passage and to force pressurized fluid into said second port, said housing further having a third passage adapted to connect said first port with said additional cylinder by way of said first passage, said third passage including a distributor space adapted to surround a bearing means and also including a first bore connecting said additional cylinder with said distributor space, said first passage having a second bore for said valve means and a third bore connecting said second bore with said distributor space to supply to said space fluid from said first port in said first position of said valve means, and an additional piston movable in said additional cylinder to force pressurized fluid from said additional cylinder into said second port; means for moving said pistons, comprising a rotary drive member; bearing means for said drive member, said bearing means being disposed in said distributor space; and valve means movably installed in said first passage, said housing having a second passage connecting said second port with said first passage so that the pressurized fluid in said second port and said second passage can move said valve means from a first position in which said valve means permits fluid to flow from said first port into said cylinder and said first port communicates with said additional cylinder by way of said first passage, while the pressure of fluid in said second port is within a first range, to a second position in which said valve means seals said first port from said cylinder while the pressure of fluid in said second port is within a higher second range, and to a third position in which said valve means allows fluid to circulate from said second port to said first port while the pressure of fluid in said second port exceeds said second range.

3,982,856

BASE AND POWER UNIT FOR INJECTION MOLDING MACHINE

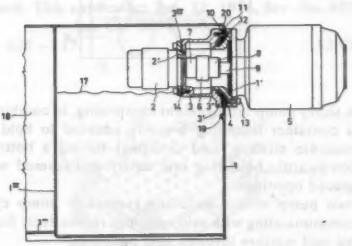
Karl Hehl, Siedlung 183, 7291 Lassburg, Wurttemberg, Germany

Continuation of Ser. No. 322,683, Jan. 11, 1973, abandoned. This application Apr. 14, 1975, Ser. No. 567,833

Claims priority, application Germany, Jan. 11, 1972, 2201078

Int. Cl.² F04B *17/00;* **F16F** *15/00*

U.S. Cl. 417—360 **12 Claims**



1. A device for elastically mounting a power unit in a machine base, the power unit being a hydraulic pump and a coaxially coupled electric motor, or a similar vibration-generating unit, and the machine base being, for example, the base of an injection molding machine, the device comprising in combination:

a generally flat wall which forms a part of the machine base and extends substantially perpendicularly to the rotational center axis of the power unit, the wall having a center opening for the accommodation of the power unit in such a way that the power unit is positioned partially on one side of the wall and partially on the other side of the wall;

a pair of cooperating mounting flanges defined by the power unit and arranged on opposite sides of the wall, the mounting flanges having oppositely facing planar clamp-

ing faces aligned in parallel with the wall and larger in size than said center opening, so as to define therewith bilateral areas of radial clamping overlap;

two resiliently compressible discs interposed between the clamping faces of said power unit mounting flanges and the wall in said areas of radial clamping overlap;

means for clamping said mounting flanges axially against one another, with the result of compressing the interposed resilient discs and creating a clamping engagement between the power unit flanges and the wall; and

matching centering formations defined by the mounting flanges, by the wall, and by the interposed resilient discs, respectively, within said areas of clamping overlap, the centering formations taking the form of recesses in the mounting flanges, in the wall, and in the resilient discs, in one axial direction and of matching protrusions in said members in the other axial direction, thereby radially centering the power unit in relation to the wall in a position which is independent of the exact location of the center opening and of any other opening in said wall.

3,982,857

SUPPORT MEANS FOR MOVABLE CONNECTOR IN CONCRETE PUMP ARRANGEMENT

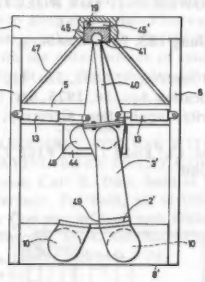
Karl Schlecht, Echterdinger Str. 91, D-7024 Bernhausen, Germany

Filed Oct. 15, 1974, Ser. No. 514,387

Claims priority, application Switzerland, Oct. 17, 1973, 14673/73

Int. Cl.² F04B *15/02*

U.S. Cl. 417—519 **13 Claims**



1. A slurry pump arrangement comprising, in combination:

a. a container bounding a cavity adapted to hold a fluid concrete mixture, said container having a bottom wall downwardly bounding said cavity and formed with two spaced openings;

b. two pump means including respective pump cylinders communicating with said openings respectively for pumping said mixture through said openings;

c. a tubular connector having two terminal orifices respectively adjacent said openings in said cavity and upwardly spaced from said openings in the operative condition of said arrangement;

d. a rigid support fixedly fastened to said container and including a frame having two upright column members and at least two transverse beam members connecting said column members and vertically spaced from each other, one of said beam members being vertically spaced from said cavity and from another beam member in an upward direction, said connector being movably supported by said one beam member;

e. a discharge conduit connected to said upwardly spaced orifice; and

f. operating means for shifting said connector on said one beam member between two positions in which said adjacent orifice substantially sealingly engages said bottom wall about said openings respectively and thereby connects one of said pump cylinders to said discharge conduit, while the other pump cylinder communicates with said cavity.

3,982,858

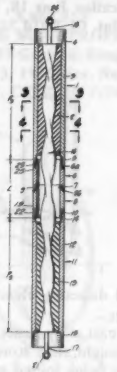
SEGMENTED STATOR FOR PROGRESSIVE CAVITY TRANSDUCER

John E. Tschirky, Long Beach, Calif., assignor to Smith International Corporation, Inc., Newport Beach, Calif.

Continuation-in-part of Ser. No. 415,754, Nov. 14, 1973, abandoned, and a continuation-in-part of Ser. No. 433,540, Jan. 15, 1974, Pat. No. 3,912,426. This application July 11, 1975, Ser. No. 595,053

Int. Cl.² F04C *1/06*

U.S. Cl. 418—48 **6 Claims**



1. A series stator array for a progressive cavity transducer comprising a plurality of stator segments having a uniform pitch P_s, one end of a first stator segment connected to an end of a second stator segment by a hollow tubular connection, one end of said tubular connection connected to the first stator segment and the other end of said tubular connection connected to an end of said second stator segment, the separation of the said ends being related to the angular displacement of the major axis of the stator openings of the adjacent stator segments by

$$a = \frac{L}{P_s} \times 360°$$

where (a) is the angular displacement and L is the separation between the said ends and P_s is the pitch of the stator in the first and second stator segments.

3,982,859

FLOATING FLOW RESTRICTORS FOR FLUID MOTORS

John E. Tschirky, Long Beach, and Bela A. Geczy, Glendale, both of Calif., assignors to Smith International Corporation, Inc., Newport Beach, Calif.

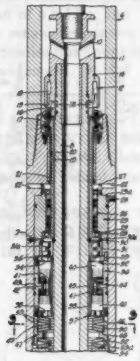
Filed July 11, 1975, Ser. No. 595,054

Int. Cl.² F01C *1/10, 21/00*; E21B *3/12, 17/00*

U.S. Cl. 418—48 **7 Claims**

1. A hydraulic motor including a stator in a housing and a rotor in said stator, a shaft connected to said rotor, a fluid inlet to said stator, and a fluid outlet from said stator, a thrust bearing mounted on said shaft and housing, a fluid passageway connected to the fluid outlet from said stator through the housing, a flow restrictor positioned in said passageway between the stator outlet and said thrust bearing, said flow restrictor comprising a first sleeve flexibly mounted at one end

of said sleeve on said shaft and spaced radially from said shaft and forming an annular space between said shaft and said first sleeve, a radial bearing mounted at the other end of said first



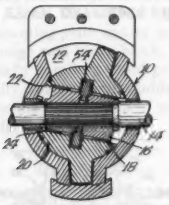
sleeve and between said first sleeve and said housing, a second sleeve mounted on said housing adjacent to but spaced radially from said first sleeve.

3,982,860

THRUST BEARINGS FOR SLANT AXIS ROTARY MECHANISMS

Paul J. Staebler, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 8, 1975, Ser. No. 638,779
Int. Cl.² F01C 1/02
U.S. Cl. 418—53 **6 Claims**



1. In a slant axis rotary mechanism, the combination comprising:

a housing defining an operating chamber;

a shaft journalled in said housing and including an angularly offset portion within said chamber, said angularly offset portion including a generally radially extending shoulder;

a unitary rotor journalled on said angularly offset portion and within said chamber, said rotor including a central bore receiving said angularly offset portion, said bore including a radially inwardly opening groove;

a plurality of thrust collar segments in said groove and extending partially out of the same into embracing relation with said shoulder;

a positioning collar on said shaft sandwiching said segments against said shoulder, said positioning collar defining a continuation of said angularly offset portion and journalling said rotor; and

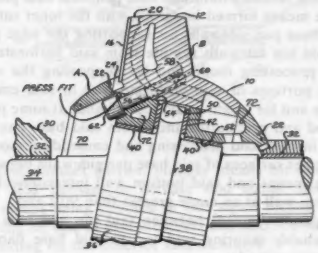
means holding said positioning collar against axial and rotational movement on said shaft.

3,982,861

ROTOR CONSTRUCTION FOR SLANT AXIS ROTARY MECHANISMS

Myron R. Gibson, Edelstein, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 12, 1975, Ser. No. 640,083
Int. Cl.² F04C 17/02
U.S. Cl. 418—53 **4 Claims**



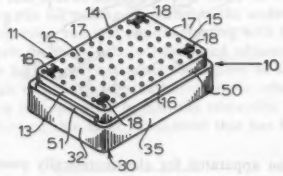
1. In a slant axis rotary mechanism including a housing, a shaft journalled in the housing, an angularly offset portion on said shaft and including a peripheral thrust collar, and a two-piece rotor journalled on said angularly offset portion and sandwiching said thrust collar, said rotor having a spherical hub with a peripheral flange, the improvement wherein one of said rotor pieces includes a central cavity spaced from said angularly offset portion, and a plurality of angularly spaced bolts within said cavity and extending through said pieces to secure said pieces together.

3,982,862

TWO-PART COMPOSITE DEVICE FOR HISTOLOGIC TISSUE PROCESSING AND EMBEDDING

John E. P. Pickett, 3323 Pinafore Drive; Thomas D. Kinney, 3120 Devon Road, and Gene M. Winders, 5332 N. Willowhaven Drive, all of Durham, N.C. 27705

Continuation-in-part of Ser. No. 564,595, April 3, 1975, abandoned. This application Jan. 22, 1976, Ser. No. 651,505
Int. Cl.² B29C 1/00, 1/14
U.S. Cl. 425—117 **12 Claims**



1. A composite histologic tissue structure useful for holding and transporting a tissue specimen during the processing and embedding of such specimen, for holding the embedded tissue specimen in a selected plane during microtome cutting and for storing the remaining unsliced embedded specimen, comprising in combination:

a. a box-like top member having one end open and the opposite end closed by a central rectangular perforate wall and having interconnecting sidewalls extending from the edges of said perforated wall, said sidewalls having exterior surface means for being held between the opposing jaws of a microtome clamp during slicing of the embedded tissue specimen;

b. a box-like base pan member having one end open and the opposite end closed by a thin, substantially flat bottom wall and having interconnecting sidewalls extending from the edges of said base wall, said base pan sidewalls having inner dimensions smaller than the outer peripheral dimensions of said top sidewalls so as to allow the top and base pan to be joined in either a processing mode wherein the open end of said top member resides within said base pan or in an embedding mode wherein the closed end of said top resides within said base pan, said base pan having ledge means formed integrally with the inner surfaces of said base pan sidewalls for supporting the edge portions of said top sidewalls remote from said perforate wall in said processing mode and for supporting the marginal edge portions of said perforate wall in said embedding mode and for locating said top member at some predetermined and precise distance from said base pan bottom wall in both said processing and embedding modes, and the inner surfaces of said base pan sidewalls between said ledge means and said bottom wall interconnecting said bottom wall at an angle greater than 90°; and

c. cooperative means between said top and base pan for detachably securing said top to said base pan in said processing mode;

in said processing mode the composite structure providing an integral, perforate enclosure for holding and transporting the tissue specimen through the various processing fluids, and in said embedding mode the composite structure providing a mold in which said perforate wall serves to retain a hardened molded body containing the tissue specimen and formed within said base pan member.

3,982,863

QUENCHING OF POLYMERIC FILM

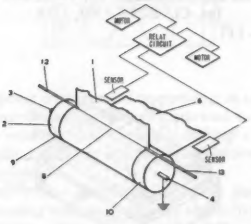
Raymond John Latham, Stoke-on-Trent, and Arthur John Holloway, Hertford, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 358,346, May 8, 1973, abandoned. This application Aug. 19, 1974, Ser. No. 498,852

Claims priority, application United Kingdom, May 12, 1972, 22341/72

Int. Cl.² B29D *7/22*

U.S. Cl. 425—135 **5 Claims**



1. In an apparatus for electrostatically pinning a molten polymeric film to an electrically earthed casting surface which comprises a pinning wire electrode extending transversely across the casting surface and connected to a high voltage electrical source, the pinning wire electrode being supported in spaced relation from the molten film for the deposition of electrostatic charges upon the film in the proximity of or prior to the region of first contact of the film and the casting surface, and being electrically insulated by dielectric insulators located beyond the film edges, the improvement wherein the dielectric insulators are movable along the wire electrode by an amount corresponding to any transverse fluctuations that may occur in the film edges by means which are activated by a sensor of the transverse fluctuations of the film edges whereby sparking between the wire electrode and the margins of the casting surface is impeded.

3,982,864

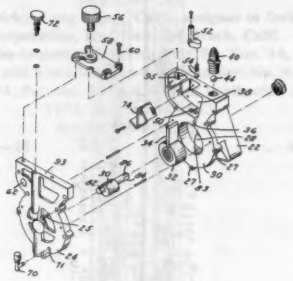
VACUUM PUMP

Robert L. Cain, Montpelier, Ohio, assignor to Robinair Manufacturing Corporation, Montpelier, Ohio

Filed Sept. 15, 1975, Ser. No. 613,361

Int. Cl.² F04C *27/00*

U.S. Cl. 418—149 **9 Claims**



1. The method of sealing the interface between a pair of members against atmospheric leakage in the presence of a vacuum, at least one of which members is aluminum, comprising: machining the faces to a flush and lapped or mated condition, hard anodizing the machined face of the aluminum member, coating the anodized face with a high vacuum grease, and clamping the faces tightly together.

3,982,865

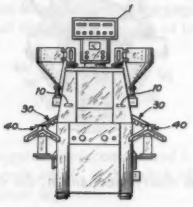
APPARATUS FOR HIGH-SPEED ACCURATE COUNTING AND HANDLING OF DISCRETE OBJECTS SUCH AS TABLETS

Jim Mills Adams, West Caldwell, and Edward Francis de Zabala, Pequannock, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 453,238, March 21, 1974. This application Sept. 15, 1975, Ser. No. 613,681

Int. Cl.² B30B *11/02, 15/22, 15/32*

U.S. Cl. 425—149 **6 Claims**



1. Improved tablet making apparatus, in which via at least two separate but identical operations a predetermined amount of powder substance is introduced into successive ones of a multiplicity of dies contained in a moving member and pressed into tablets, the tablets then being successively ejected from their respective dies at a pre-established station for subsequent collection into containers, there being a respective one of said stations corresponding to each said operation, the apparatus further having means for adjustably controlling the pressing force giving rise to the formation of a tablet from the predetermined amount of powder, wherein the improvement comprises:

a. sensing means including a strain detecting sensor arrangement, associated with each of the separate operations, in operative arrangement with the means for adjustably

controlling the tablet pressing force and adapted to be prestressed by the adjustments of the latter, the arrangement of said strain detecting sensing arrangement in conjunction with the means for controlling the tablet pressing force being such as to enable a sensing of a relaxation of said prestressing which is derived from a proper formation of a tablet; and

b. control counter means responsive to said sensing means for providing a continuous count of the tablets sensed by each sensor arrangement.

3,982,866

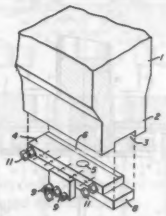
DEVICE FOR ALIGNMENT OF BRIQUETTE ROLLS

William L. Lauterbach, Upper St. Clair Township, Allegheny County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 442,293, Feb. 13, 1974, Pat. No. 3,909,079. This application Apr. 4, 1975, Ser. No. 565,317

Int. Cl.² F16C 25/00

U.S. Cl. 425—168 4 Claims



1. An adjustable guide device for a roll-type briquetting machine comprising:

a. a substantially horizontal mounting plate having means for horizontal adjustment,

b. a guide block on said mounting plate, having a substantially horizontal surface and a guide edge for alignment substantially perpendicular to the axis of a mold roll,

c. a vertical pin having threads for engagement with and through said mounting plate and an unthreaded extension for passing through said guide block,

d. a gib substantially parallel to said guide block and situated substantially adjacent to the guide edge thereof, and

e. means for adjusting the position of said gib with respect to the guide edge of guide block.

3,982,867

CONSTRUCTION DECK ELEVATION GAUGE AND EASY-OUT BOLT ASSEMBLY

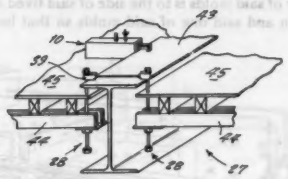
Vernon E. Pruett, Rte. No. 2, Box 1, Worthington, Ind. 47471

Division of Ser. No. 530,063, Dec. 6, 1974, which is a continuation-in-part of Ser. No. 403,282, Oct. 3, 1973, abandoned. This application May 29, 1975, Ser. No. 581,875

Int. Cl.² G08B 21/00; B29C 1/00

U.S. Cl. 425—171 6 Claims

1. In combination, a bridge structure and an elevation gauge, said bridge structure having an adjustably movable deck member and a relatively stationary support member, said gauge for use in establishing the prescribed elevation difference between said adjustably movable deck member and said relatively stationary support member, the improvement in which said elevation gauge comprises a case, a first contact carrier disposed in said case, means for guiding said first contact carrier for vertical movement in said case, selectively adjustable means for moving said first contact carrier vertically in said case, means for indicating the selected vertical position of said first contact carrier relative to said case, said indicating means including scale means and indicator means cooperatively connected to said case and said first contact carrier, a second contact carrier, means for guiding said second contact carrier for vertical movement on said case, and means for providing an output signal when said second contact carrier is in a pre-selected elevational position relative



to said first contact carrier, plunger means for cooperating between said carriers to actuate said signal means, said plunger means being coupled to said signal means, and said case resting on one of said members and said second contact carrier resting on the other of said members.

3,982,868

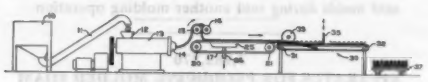
CONTINUOUS MOLD THERMO FORMING

William Richard Rinker, Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Oct. 14, 1975, Ser. No. 621,948

Int. Cl.² B29C 13/00, 15/00

U.S. Cl. 425—223 5 Claims



1. An apparatus for the continuous molding of sheet material comprising an endless flexible belt mold having a three dimensional irregular pattern with valleys formed therein, said flexible belt mold having laterally spaced side members defining the lateral limits of the belt mold, said belt mold having a plurality of spaced openings in said belt mold located in said valleys, means for moving said belt mold through an endless path having a conveying run and a return run, roller die means mounted adjacent to said belt mold operative to form and deposit a film layer onto said conveying run that extends laterally onto said spaced side members, means at one end of said conveying run for pulling a vacuum to the underside of a portion of conveying run and communicating with the openings in said belt mold, an extruder mounted adjacent to said roller dies for forming an extrudate for deposit to said roller dies, and a pair of laterally spaced knives at the other end of said conveying run operative to trim the respective side portions of the formed thin layer of material that has been vacuum formed.

3,982,869

INJECTION MOLDING APPARATUS WITH ALTERNATIVELY SHUTTLED MOLD SECTIONS

James W. Eggers, 1018 Bridal Wreath, Shreveport, La. 71108

Filed July 22, 1974, Ser. No. 490,722

Int. Cl.² B29F 1/00

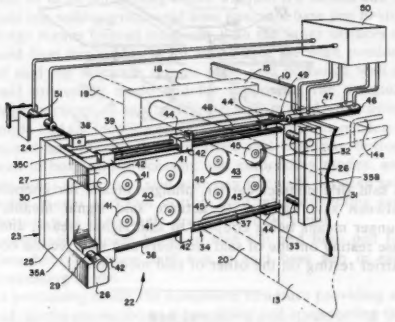
U.S. Cl. 425—246 13 Claims

1. A shuttle mold assembly for a horizontal injection molding apparatus including a fixed and movable platen, comprising:

means on the shuttle assembly for mounting said assembly between said fixed and movable platens;

a first shuttle mold mounted for movement on said assembly and including at least one molding cavity;

a second shuttle mold mounted for movement on said assembly and including at least one molding cavity; and means connected to the molds for alternatively moving said first and second shuttle molds between a position on said assembly where one of said molds is between said fixed and movable platens for a molding operation and the other of said molds is to the side of said fixed and movable platen and said one of said molds so that loading or unloading operations may be performed on said other of said molds during said molding operation, and a position where said other of said molds is between said fixed and movable platens for another molding operation and said one of said molds is to the side of said fixed and movable platens and said other of said molds so that loading or unloading operations may be performed on said one of said molds during said another molding operation.



3,982,870

APPARATUS FOR PRODUCING MOLDED FOAM ARTICLES WITHOUT DEFECTS

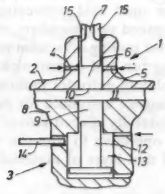
Heinrich Boden, Opladen, and Ulrich Knipp, Schildgen-Nittum, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 14, 1975, Ser. No. 558,516

Claims priority, application Germany, Mar. 20, 1974, 2413357

Int. Cl.² B29D 27/00

U.S. Cl. 425—252 **2 Claims**



1. In an apparatus for supplying mixed foamable reactants to a mold comprising a mixing chamber bounded by a side wall portion containing injection apertures, a first ejector piston displaceable in the bore of the mixing chamber from a position behind the injection apertures to a position wherein its end surface forms a planar surface with a wall of the mold and an outlet aperture which communicates with the mold cavity, the improvement wherein a second ejector piston is provided in the mold wall opposite said outlet aperture and directly opposite said first piston, said second piston being retractable in a direction away from the mold cavity from a position wherein the end surface of said second piston forms a planar surface with said mold wall to a position wherein a receiving chamber is formed in said mold wall to catch any unmixed reactants.

3,982,871

METHOD AND DEVICE FOR FORMING A SOCKET ON A PLASTIC TUBE

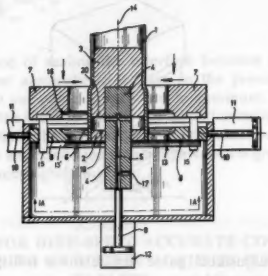
Adolf Möddel, Bernhard Lohmann Strasse 29, Darme, Germany

Division of Ser. No. 863,612, Oct. 3, 1969, abandoned. This application Feb. 20, 1974, Ser. No. 444,244

Claims priority, application Germany, Oct. 3, 1968, 6800552[U]

Int. Cl.² B29C 17/00

U.S. Cl. 425—393 **9 Claims**



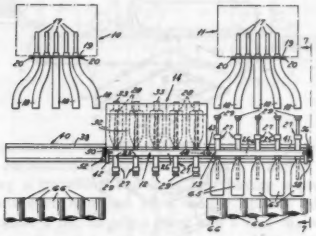
1. Apparatus for forming a socket with an annular external bead on a length of tubular pipe of thermoplastic material, said apparatus comprising a mandril constituted by two spaced parts which are movable axially relative to one another, said mandril having an outer surface which is shaped to form a socket on the pipe when the mandril is inserted into the pipe to deform the same, a mold positioned around said pipe in opposition to said parts of the mandril, said mold including two pairs of axially spaced jaws each associated with a respective part of said mandril and including two jaw members radially movable towards the pipe, said pairs of jaws also being movable axially relative to one another, means connected to at least one of said pairs of jaws for moving said two pairs of jaws radially inwards to clamp the pipe against said parts of the mandril at axially spaced locations, means connected to one of said mandrel parts for axially moving one pair of said jaws and associated mandril part with respect to the other pair of said jaws and mandril part to cause said pairs jaws to abut against one another and move the parts of the pipe, at the locations where they are clamped by the jaws and mandril parts, towards one another to upset the pipe between said locations, said jaws being provided with grooves defining an annular cavity when the jaws abut one another, said annular cavity defining the shape of the bead for the pipe when the jaws are clamped against the pipe and have been axially moved into contact with one another, and means between said mandrel parts for applying internal pressure against said pipe in the region between said locations to urge the upset portion of the pipe outwardly into conformance with said annular cavity in the jaws.

3,982,872

LATERAL TRANSFER LOADING APPARATUS FOR STRETCH BLOW MACHINES

Ivan L. Kauffman, Commerce Township, Oakland County, and Robert C. Kellogg, Hartland Township, Livingston County, both of Mich., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed June 16, 1975, Ser. No. 587,949
Int. Cl.² B29C 17/02
U.S. Cl. 425—397 18 Claims



1. In a stretch blow molding apparatus, including a mold assembly having at least one mold, the combination comprising:

a. a first movably mounted carrier means, and a second movably mounted carrier means;

b. each of said first and second carrier means having operatively mounted thereon at least one stretch pin assembly;

c. a first loading station for unloading a finished product from the stretch pin assembly on said first carrier means and for loading a preform thereon;

d. a second loading station for unloading a finished product from the stretch pin assembly on said second carrier means and for loading a preform thereon; and,

e. means for moving alternately, said first carrier means between said first loading station and a position in operative relationship with said mold assembly, and said second carrier means between said second loading station and a position in operative relationship with said mold assembly, whereby when said first carrier means is at said first loading station the second carrier means is in said position in operative relationship with said mold assembly for forming a finished product from the preform carrier thereon, and when said second carrier means is at said second loading station said first carrier means is in said position in operative relationship with said mold assembly for forming a finished product from the preform carried thereon.

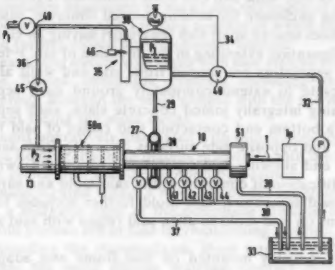
3,982,873

SEALING DEVICE

August Graeber; Friedrich Fleischer, and Gerhard Werner, all of Coesfeld, Germany, assignors to Maschinenbau Scholz GmbH & Co. KG, Corsfeld, Germany

Filed Nov. 19, 1975, Ser. No. 633,555
Claims priority, application Germany, Nov. 29, 1974, 2456502; July 30, 1975, 2534004
Int. Cl.² B29D 7/20; B29C 25/00; B29H 5/28
U.S. Cl. 425—404 19 Claims

1. A vulcanizing device in which a member is enclosed in an extruder device and the enclosed member is vulcanized at a predetermined pressure in a vulcanizing tube connected to the extruder device wherein said vulcanizing tube is placed at a distance from said extrusion device, a sealing device is positioned directly before and coaxially to said vulcanizing tube, the length of the sealing device being less than the said distance, a sealing housing is contained in said sealing device, spaced radial guiding elements are provided in the interior of said sealing housing having coaxial openings for the passage of said enclosed member and dividing the interior of said sealing housing into individual chambers lying axially behind each other, an inlet opening is provided between the ends of said



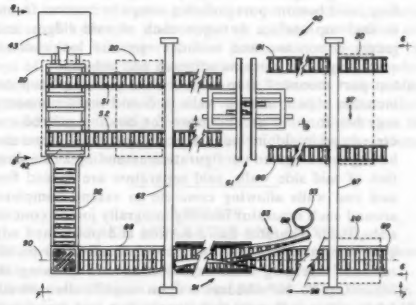
sealing housing, which opening is connected to a source of a locking medium, the pressure of which is arranged to be somewhat higher than the pressure in said vulcanizing tube, and said chambers are connected to outlet openings in said sealing housing, which are connected to throttled discharge conduits.

3,982,874

PRODUCTION LINE APPARATUS FOR PRODUCING CONCRETE FLOORS

Paul J. Nobbe, R.R. 2, Brookville, Ind. 47012

Filed Mar. 27, 1975, Ser. No. 562,652
The portion of the term of this patent subsequent to Oct. 28, 1992, has been disclaimed.
Int. Cl.² B28B 5/04
U.S. Cl. 425—424 11 Claims



1. An apparatus for producing concrete floors comprising:

a main frame;

a mold for producing a concrete floor with a smooth top surface, said mold includes a bottom part with a smooth finish top surface extending thereacross to form said

smooth top surface of said floor, said bottom part including a plurality of longitudinally extending ridges extending upwardly from said top surface, said bottom part includes a separate recess formed in said top surface between each of said ridges, each recess is concave and includes opposite longitudinally extending edge portions adjacent said ridges, said mold further includes a top part mounted atop said bottom part, said top part includes a pair of side walls and end walls connected together forming an enclosure for holding poured concrete, said mold includes spaced apart slab separators having an elongated configuration extending in the direction of said side walls, said separators are spaced from said end walls allowing concrete to extend completely around each separator forming integrally joined concrete slabs, each separator has a bottom end contacting said ridges of said bottom part and opposite side surfaces diverging from said bottom end allowing said separators to be withdrawn upon solidification of concrete within said mold and surrounding said separators, said mold further includes locating means on said mold to align said ridges with said separators;

a table movably mounted on said frame and adapted to receive and support said mold;

a source a flowable concrete positioned adjacent said table and having an outlet positioned over said mold directing concrete to flow from said source into said open top of said mold;

shaking means connected to and between said frame and said table and operable to shake said table and mold settling concrete within said mold;

first conveying means extending away from said table being sized to supportingly receive said mold and operable to convey said mold from said table to a first location;

mold turning over means located at said first location being sized to supportingly receive said mold from said first conveying means and operable to turn said mold upside-down with said open top facing downwardly; and,

second conveying extending toward said table, said second conveying means being sized and positioned to supportingly receive said mold when said mold is upside-down and operable to turn said mold right-side-up with said open top facing upwardly.

11. A mold for producing a floor with a smooth top surface and having integrally joined concrete slabs for supporting animals comprising:

a bottom part with a smooth finish top surface extending thereacross to form said smooth top surface of said floor, said bottom part including a plurality of longitudinally extending ridges extending upwardly from said top surface, said bottom part includes a separate recess formed in said top surface between each of said ridges, each recess is concave and includes opposite longitudinally extending edge portions adjacent said ridges;

a top part mounted atop said bottom part, said top part includes a pair of side walls and end walls connected together forming an enclosure for holding poured concrete, said mold includes spaced apart slab separators having an elongated configuration extending in the direction of said side walls, said separators are spaced from said end walls allowing concrete to extend completely around each separator forming integrally joined concrete slabs, each separator has a bottom end positioned adjacent said ridges of said bottom part and opposite side surfaces diverging from said bottom end allowing said separators to be withdrawn upon solidification of concrete within said mold and surrounding said separators;

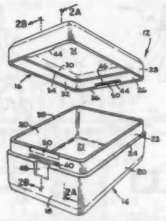
locating means on said mold to align said ridges with said separators, said locating means includes a plurality of clips positioned between said separators and said ridges, said clips being engaged with said separators and said ridges with said locating means being operable to allow release of said concrete to facilitate removal of said separators from said ridges.

3,982,875

APPARATUS FOR MAKING MOLDED ARTICLES OF EXPANDED CELLULAR MATERIAL AND PRODUCT THEREOF

John A. Abey, Salinas, Calif., assignor to Bud Antle, Inc., Salinas, Calif.

Continuation of Ser. No. 510,289, Sept. 30, 1974, abandoned.
This application Jan. 12, 1976, Ser. No. 648,243
Int. Cl.[2] B29C 7/00; B28B 7/10
U.S. Cl. 425—444 **10 Claims**



1. In apparatus for molding a part wherein the apparatus is of the class having a male mold section, a female mold section shaped complementary to the male mold section, and means for supporting said mold sections in a first position defining therebetween a cavity having a shape corresponding to the part to be formed, said supporting means including means for separating said sections from one another along a path to a second position, and wherein said part has diametrically opposite wall portions extending in a direction generally parallel to the path, the improvement comprising first and second ejector heads, portions of said male mold section adjacent respective said wall portions defining first and second recesses complementally shaped to receive respective said ejector heads, said ejector heads each having a surface portion flush with and bounding a portion of said cavity when the ejector head is received in a respective said recess, said surface portions being oriented perpendicular to said path so that upon movement of said ejector heads out of said recesses said surface portions bear on and slide transversely along corresponding surfaces of the part to eject the part from the male mold, said ejector heads each being operable to eject a part from said male mold section and having an elongate surface discontinuity shaped to form a corresponding mirror image discontinuity in respective said wall portions of said part, said surface discontinuities being less extensive than and spaced from said surface portions to avoid overstressing the portions of the part adjacent the corresponding mirror image therein, and means including first and second rigid rod pairs operable in the second position for moving respective said ejector heads away from said male mold section to eject said part therefrom, the rods in said pairs being fixed at spaced apart points to respective said ejector heads remote from said surface portions and surface discontinuities, said ejector moving means being simultaneously operable to move said ejector heads outwardly away from said male mold section and in respective straight line directions acutely oblique of said path so as to retract laterally respective said ejector discontinuities from corresponding mirror image discontinuities in said wall portions of said part, the individual rods in said pairs moving in unison to avoid relative angular movement between the surface discontinuities on said ejector heads and the corresponding mirror image discontinuities on said part.

3,982,876

APPARATUS FOR MAKING PLATE ELEMENTS

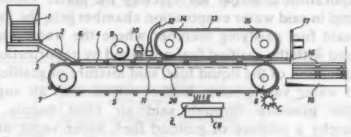
Kurt Eisenbach, Bonn-Bad Godesberg, Germany, assignor to Rheinische Chamotte und Dinas-Werke, Bonn-Bad Godesberg, Germany

Division of Ser. No. 472,897, May 23, 1974. This application Jan. 9, 1975, Ser. No. 539,737

Claims priority, application Germany, May 25, 1973, 2326762

Int. Cl.² B29C *3/02, 3/04*

U.S. Cl. 425—501 10 Claims



1. Apparatus for making plate elements composed of tiles partially embedded in a synthetic plastic material backing, comprising a travelling conveyor belt having a plurality of depressions each bounded by a sealing lip and adapted to accommodate a tile having a front and a rear major surface and a circumferential surface; a source of tiles; means for feeding tiles from said souce into said depressions so that the rear major surfaces of the tiles face away from said conveyor belt and said sealing lips sealingly contact the circumferential surfaces of the tiles and space the latter from one another; means for depositing a layer of hardenable synthetic plastic material over the rear major surfaces of the tiles accommodated in said depressions of said conveyor belt so as to partially penetrate between the tiles and thus partially embed the same and unite them into a unitary structure upon hardening of said synthetic plastic material to form said backing, said sealing lips preventing penetration of the synthetic plastic material to the front major surfaces of the tiles; and means for subdividing said unitary structure into plate elements of desired size, each incorporating a plurality of the tiles partially embedded in the hardened synthetic plastic material backing so that the front major surfaces of the tiles are exposed.

3,982,877

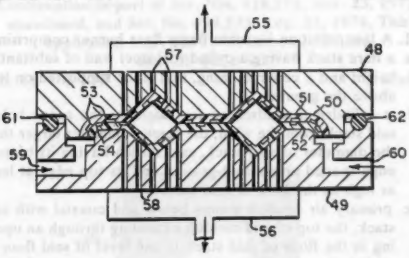
APPARATUS FOR EXPANDING SEALING A LAMINATED PLASTIC PREFORM

Nathaniel Convers Wyeth, Mendenhall, Pa., and Frank William Arnoth, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 443,199, Feb. 15, 1974, Pat. No. 3,935,358, which is a continuation-in-part of Ser. No. 346,164, March 29, 1973, abandoned. This application Jan. 6, 1975, Ser. No. 538,759

Int. Cl.² B29C *17/04*

U.S. Cl. 425—503 11 Claims



1. Apparatus for preparing a hollow, rib-reinforced, laminated article from a composite preform comprising at least two sheets in interfacial contact, at least one sheet being a thermoplastic material and at least one sheet provided with grooves or integral projections on the surface which contacts the other sheet, which grooves or integral projections form fluid passageways in the preform, said apparatus comprising:

a. means for heating the composite preform to the thermoforming temperature of the thermoplastic sheet;

b. opposing mold platens operatively associated with said heating means, at least one of the mold platens having a rib-forming mold cavity, said mold platens having a thermoforming position in which the platens are spaced apart a distance equivalent to about the thickness of the composite preform and a sealing position in which the platens are further closed an incremental amount;

c. means operatively associated with said platens for placing the heated composite preform including the edges thereof, between the mold platens with the thermoplastic sheet facing the mold cavity;

d. means operatively associated with said platens for closing and holding the mold platens in contact with the composite preform in said thermoforming position;

e. means located within a mold platen for supplying a fluid to a marginal edge of the composite preform while the mold platens are in said thermoforming position, thereby distending the thermoplastic sheet into the mold cavity while the mold platens maintain contact between the sheets in nondistended areas; and

f. means operatively associated with said platens for further closing the mold platens an incremental amount to said sealing position to pressure seal at least a portion of the nondistended areas of the composite preform.

3,982,878

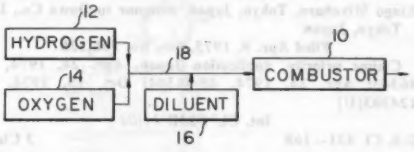
BURNING RATE CONTROL IN HYDROGEN FUEL COMBUSTOR

Kimitaka Yamane; Zene Ueno; Akira Morita, all of Tokyo; Tadahiko Nagaoka, Tokorozawa, and Shigeo Iwaki, Akishima, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 9, 1975, Ser. No. 621,242

Int. Cl.² F23K *5/00*

U.S. Cl. 431—2 11 Claims



1. A method of burning hydrogen contained in a gaseous mixture of hydrogen and oxygen or air at a controlled and relatively low burning rate in a combustor, comprising the steps of: regulating the quantitative ratio of oxygen to hydrogen in said gaseous mixture to the stoichiometric ratio; adding a gaseous diluent to said gaseous mixture outside said combustor, said diluent having a heat conductivity not higher than the heat conductivity of nitrogen gas; and feeding the diluted mixture to said combustor.

3,982,879

FURNACE APPARATUS AND METHOD

William C. Pfefferle, Middletown, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Murray Hill, N.J.

Continuation-in-part of Ser. No. 142,939, May 13, 1971, abandoned, and a continuation-in-part of Ser. No. 164,718, July 21, 1971, abandoned, and a continuation-in-part of Ser. No. 358,411, May 8, 1973, Pat. No. 3,928,961. This application Jan. 2, 1975, Ser. No. 538,211

Int. Cl.² F23L *9/00*

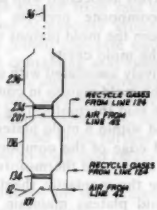
U.S. Cl. 431—10 34 Claims

1. The method of combusting carbonaceous fuel to produce energy in the form of heat comprising the steps of:

thermally combusting a first mixture, formed of carbonaceous fuel and an amount of air substantially less than that needed for complete combustion to carbon dioxide and water of all the combustible components in said fuel, to produce a gaseous first effluent containing a substantial proportion of carbon monoxide;

withdrawing heat from the gaseous first effluent;

mixing at least a portion of the gaseous first effluent with an additional amount of air to form a second mixture having an adiabatic flame temperature above the instantaneous auto-ignition temperature of said second mixture;



combusting a portion of said second mixture in the presence of a solid oxidation catalyst operating at a temperature substantially above said instantaneous auto-ignition temperature of said second mixture but below a temperature that would result in any substantial formation of oxides of nitrogen to oxidize at least a portion of the carbon monoxide in said second mixture to carbon dioxide; and

combusting the remainder of said second mixture downstream of the catalyst, said combustion downstream of the catalyst being induced and maintained by the temperature levels resulting from the combustion taking place in the presence of said catalyst.

3,982,880

LIQUID FUEL BURNER

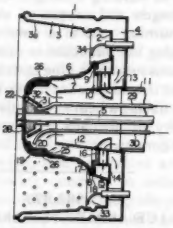
Kingo Miyahara, Tokyo, Japan, assignor to Dowa Co., Ltd., Tokyo, Japan

Filed Apr. 9, 1975, Ser. No. 566,225

Claims priority, application Japan, Apr. 24, 1974, 49-46343; Apr. 24, 1974, 49-46344; Oct. 15, 1974, 49-124303[U]

Int. Cl.² F23D 11/04

U.S. Cl. 431—168 **3 Claims**



1. A liquid fuel burner for burning liquid fuel in gasified form by converting the liquid fuel and water into a mixture of gasified fuel and water vapor comprising:

a main body of the burner;

a rotary shaft inserted in said main body of the burner;

a fuel gasifying member directly supported by said rotary shaft for converting the liquid fuel supplied thereto into gasified form while the liquid fuel is caused to diffuse and move in thin film form on an inner wall surface thereof;

water supply means attached to the central portion of the inner surface of the top of said fuel gasifying member;

an air blast supply duct inserted in said fuel gasifying member for supplying an air blast under pressure into the interior of said fuel gasifying member;

a water evaporation chamber of the annular shape arranged at the corner of a top portion of said fuel gasifying member and disposed along inner periphery thereof, said water evaporation chamber being filled with a water evaporation promoting material for quickly converting the water supplied thereto into water vapor; and

a multitude of steam ejection apertures formed in said water evaporation chamber for ejecting the water vapor produced in said water evaporation chamber into the interior of said fuel gasifying member where the water vapor is mixed with the gasified fuel produced by vaporization and gasification of the liquid fuel, said mixture of gasified fuel and water vapor being further mixed with air supplied under pressure through said air blast supply duct, whereby a mixture of gasified fuel, water vapor and air can be ejected into the main body of the burner to sustain combustion of the liquid fuel in gasified form.

3,982,881

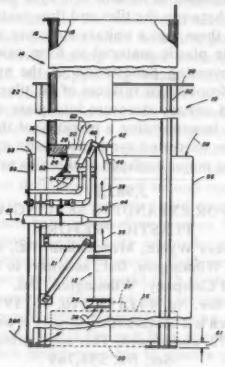
INVISIBLE FLARE BURNER

Robert E. Schwartz, and Roger K. Noble, both of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed Feb. 3, 1975, Ser. No. 546,210

Int. Cl.² F23D 13/20

U.S. Cl. 431—202 **8 Claims**



1. A low pollution invisible flame flare burner comprising:

a. a flare stack having a cylindrical steel wall of substantial height and a ceramic lining, said stack supported on legs above the ground;

b. a cylindrical windscreen for shielding the space below said stack from the wind, the screen diameter larger than the diameter of said stack, said screen having its bottom edge spaced above said ground and its top edge at least as high as the base of said stack;

c. primary air conduit means below and coaxial with said stack, the top of said conduit extending through an opening in the floor of said stack to the level of said floor of said stack;

d. burner means inside said primary air conduit supported at the top of said conduit;

e. blower means to induce primary air flow in said conduit at high velocity; and

f. means to supply secondary air through the annular space between said conduit and the wall of said opening in the floor of said stack.

3,982,882

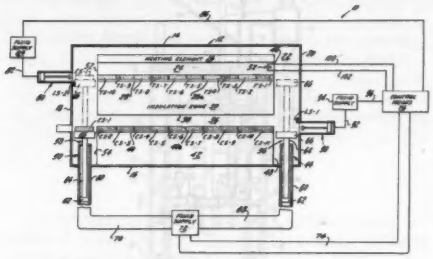
METHOD AND APPARATUS FOR PREPARING TEST SPECIMENS SUBJECTED TO DIFFERENT HEAT TREATMENTS

Saul Weingrad, Hillsdale, N.J., assignor to Commercial Decal, Inc., Mount Vernon, N.Y.

Filed May 19, 1975, Ser. No. 578,814

Int. Cl.² F27D *5/00*; **F27B** *9/40*

U.S. Cl. 432—5 **17 Claims**



1. A method of preparing test specimens subjected to heating for different time periods, which comprises feeding at least first and second test specimens to be prepared into a heating zone; heating said test specimens at a predetermined temperature for a predetermined period of time; removing said first test specimen from said heating zone, said first test specimen representing a specimen heated to said predetermined temperature for said predetermined time period; substantially simultaneously feeding a first control specimen into said heating zone to replace said first test specimen, thereby maintaining constant the total number and/or mass of specimens present in said heating zone; heating said second test specimen and said first control specimen at said predetermined temperature for an additional predetermined period of time; and thereafter removing said second test specimen from said heating zone, said second test specimen representing a test specimen heated at said predetermined temperature, under the same conditions as was said first test specimen for said predetermined period of time, as well as for said additional predetermined period of time.

3,982,883

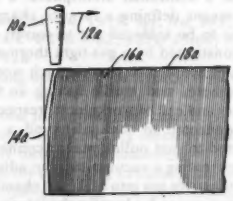
METHOD OF FLAME CUTTING

Berwyn E. Etter, 10355 Paradise Blvd., Treasure Island, Fla. 33706

Continuation-in-part of Ser. Nos. 418,271, Nov. 23, 1973, abandoned, and Ser. No. 499,533, Aug. 22, 1974. This application Mar. 18, 1975, Ser. No. 559,486

Int. Cl.² F27B *9/28*

U.S. Cl. 432—13 **3 Claims**



1. In a method of cutting or brazing workpieces consisting of solid state ceramic materials, including metals, by heat energy transfer, including radiant energy absorption, the steps of

compounding a fuel gas mixture by mixing a gaseous base fuel selected from the group consisting of methane, propane, acetylene, and mixtures thereof, with a supplemental organic heat additive, and oxygen,

said supplemental organic heat additive consisting of a series of combustible hydrocarbons which, when combusted, emit radiation energy waves within the range of greatest absorbability of the materials to be cut or brazed, and which are non-corrosive with respect to the material being cut or brazed,

said supplemental organic heat additive being added to the gaseous base fuel in an amount of from ½% to 20% by weight of the gaseous base fuel,

preparing the workpiece material for cutting or brazing by increasing the temperature of a localized area of the workpiece material to be cut or brazed to a temperature suitable for cutting or brazing, and

combusting said fuel gas mixture containing said supplemental organic heat additive in such juxtaposition to said workpiece material whose temperature has been increased as aforesaid as to transfer radiant heat energy within the range of wave lengths of greatest absorbability of the workpiece material, and convective heat energy, to said workpiece material in an amount sufficient to cause a change of state of said work piece material.

3,982,884

FLUIDIZED BED SYSTEM

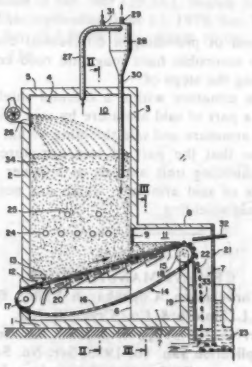
Albert Godel, deceased, late of Paris, France, by Yves Aubron, administrator, assignor to Fives-Cail Babcock, Paris, France

Filed Feb. 13, 1975, Ser. No. 549,697

Claims priority, application France, Feb. 14, 1974, 74.04956

Int. Cl.² F27B *15/00*

U.S. Cl. 432—14 **5 Claims**



1. Apparatus for treating a granular solid material comprising:

a. a main chamber;

b. an auxiliary chamber;

c. a conduit having a first orifice open toward said main chamber and a second orifice open toward said auxiliary chamber;

d. feeding means for feeding said material to said main chamber at a rate sufficient to maintain in said main chamber a first bed of said material extending upwardly beyond said first orifice to a first level and to maintain in said auxiliary chamber, via said conduit, a second bed of said material covering said second orifice;

e. conveying means for conveying agglomerates of said material from said main chamber through said conduit into said auxiliary chamber,

1. said conveying means including means for lifting conveyed agglomerates of said material in said auxiliary chamber to a second level, and for discharging the lifted material outward of said auxiliary chamber at said second level,

2. said second level being lower than said first level;

f. fluidizing means for keeping said first and second beds in fluidized condition and including means for admitting a gas under pressure to said main and auxiliary chambers beneath said beds, whereby a predetermined gas pressure is maintained in said main chamber above said first level; and

g. sealing means for maintaining above said second bed in said auxiliary chamber a gas pressure greater than said predetermined pressure.

3,982,885

METHOD AND ARRANGEMENT FOR INHOMOGENEOUS ANNEALING OF SMALL PARTS

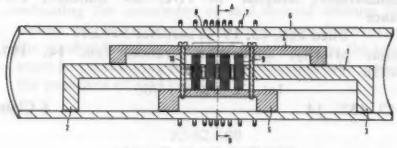
Karl Hoger, Kornwestheim, and Wolfgang Grobe, Ludwigsburg, both of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 2, 1974, Ser. No. 528,605

Claims priority, application Germany, Dec. 7, 1973, 2361184

Int. Cl.² F27D *7/00, 11/06*

U.S. Cl. 432—24 **10 Claims**



10. A method of providing a differential coercive force distribution to reversible hard magnetic reed contact armatures comprising the steps of:

inserting the armature within a thermal shielding unit to surround a part of said armature by said shielding; and

placing said armature and said shielding within an annealing furnace so that the part of said armature within said thermal shielding unit anneals at a lower temperature than parts of said armature which are not surrounded thereby said shielding.

3,982,886

CEMENT MANUFACTURE

Soren Bent Christiansen, Copenhagen Valby, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

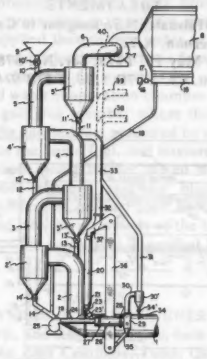
Division of Ser. No. 375,372, July 2, 1973, Pat. No. 3,887,388. This application Jan. 16, 1975, Ser. No. 541,530

Claims priority, application United Kingdom, July 10, 1972, 32232/72

Int. Cl.² F27B *7/02*

U.S. Cl. 432—106 **25 Claims**

1. A plant for the production of cement clinker wherein at least a portion of gaseous compounds containing at least one of alkali, chlorine and sulphur are removed from the exit gas of a rotary kiln comprising: a rotary kiln in which cement raw meal is burned to cement clinker; a suspension preheater for preheating the raw meal with exit gases from the rotary kiln prior to introducing the raw meal into the rotary kiln; a gas exit pipe from the rotary kiln divided into a main flow pipe connected to said preheater, and a divisional flow pipe having a shaft in communication with said main flow pipe such that a portion of the exit gases flow through said shaft; means for directing a supply of relatively cool, non-aqueous, solid, shaped condensation bodies such as spherical, cylindrical, spirally shaped bodies and the like through at least one opening in said shaft in a manner which permits said bodies to fall under the action of gravity in a substantially continuous stream through said divisional gas flow such that gaseous



compounds containing at least one of alkali, chlorine and sulphur are condensed to form a coating on at least a portion of the surface of said bodies as the gases pass through the shaft; means to intercept said coated condensation bodies at or near the end of their fall; and means to pass said bodies out of the shaft through at least one opening in said shaft.

3,982,887

FLUX-FREE SOLDERING OF ALUMINUM-CONTAINING WORKPIECES IN A CONTROLLED ATMOSPHERE

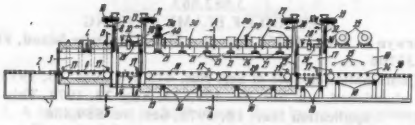
Heinz Kendziora, Bonn; Johannes Nenner, Bornheim-Merten; Heinz Schoer, Alfter, and Werner Schultze, Bonn, all of Germany, assignors to Vereinigte Aluminium-Werke Aktiengesellschaft, Bonn, Germany

Filed Oct. 31, 1973, Ser. No. 411,383

Claims priority, application Germany, Nov. 9, 1972, 2254769

Int. Cl.² F27B *9/02*

U.S. Cl. 432—128 **12 Claims**



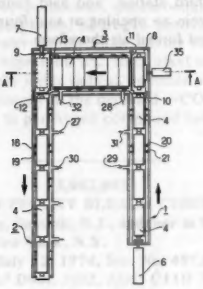
1. In a furnace for flux-free soldering of aluminum-containing workpieces in a controlled atmosphere, a combination comprising wall means defining a furnace chamber through which workpieces to be soldered are to travel, said furnace chamber being constituted by a gas-tight thermally insulated metallic muffle and adapted to contain such workpieces in a controlled atmosphere, said muffle having an inlet and an outlet for the entry and exit of workpieces, respectively; a first lock chamber connected to said inlet, and a second lock chamber connected to said outlet; means connected to each lock chamber for creating a vacuum therein; admitting means for admitting a protective gas into said lock chambers and said muffle; first heating means for heating the interior of said first lock chamber; and second heating means for heating the protective gas atmosphere in said muffle.

3,982,888

HEAT TREATMENT TUNNEL KILN FOR PRODUCTS HAVING A CIRCULAR CROSS-SECTION

Jean Moussou, Pouzac, and Robert Calvet, Tarbes, both of France, assignors to Ceraver, Paris, France

Continuation of Ser. No. 486,256, July 5, 1974, Pat. No. 3,905,758. This application July 21, 1975, Ser. No. 597,788
Claims priority, application France, July 13, 1973, 73.25851
The portion of the term of this patent subsequent to Sept. 16, 1992, has been disclaimed.
Int. Cl.[2] F27B 9/02; B65H 51/00
U.S. Cl. 432—128 11 Claims



1. A tunnel kiln comprising:
a. a plurality of cylindrical supports, each of which contains at least one cavity shaped to receive an object to be heat treated;
b. means defining a main treating zone;
c. means in said main treating zone for moving said cylindrical supports in a direction perpendicular to their longitudinal axes;
d. means in said main treating zone for rotating said cylindrical support about their longitudinal axes during their translational movement in said main treating zone;
e. means defining a second treating zone;
f. means in said second treating zone for moving said cylindrical support in a direction parallel to their longitudinal axes;
g. a first chamber connecting said main treating zone to said second treating zone, said first chamber being adapted to receive at least one of said cylindrical supports at a time; and
h. means for isolating said first chamber in a gas-tight manner from either said main treating zone or said second treating zone.

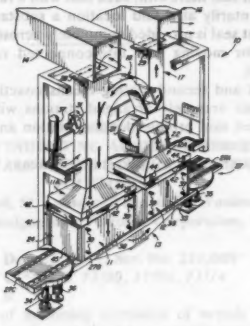
3,982,889

PREHEATING SYSTEM FOR ALUMINUM REMELT FURNACE

Benjamin F. Olson, 819 W. 22nd St., Suite 2, Tempe, Ariz. 85282

Filed July 14, 1975, Ser. No. 595,784
Int. Cl.[2] F27B 9/02; F27D 15/00, 13/00
U.S. Cl. 432—128 8 Claims

1. A preheating apparatus for a metal remelt furnace comprising:
first and second juxtapositioned chambers,
a conveyor system for moving metal containing cartridges sequentially through said chambers,
a duct system for conveying exhaust gases from a source of heat sequentially through said first and second chambers,
duct means for recirculating a part of the exhaust gases passed through said second chamber back to a portion of said duct system leading into said first chamber,
fan means within said duct system downstream of said second chambers for drawing the gases through said first and second chambers, and
damping means within said duct system for controlling the amount of hot gases recirculating through the apparatus and cooling air drawn into the apparatus from the atmosphere,



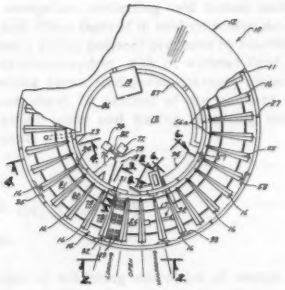
said chambers being open ended so that when a pair of cartridges are moved into the chambers opposite ends of the cartridges close opposite ends of the chambers with juxtapositioned ends of the chambers being interconnected with a part of said duct system.

3,982,890

METHOD AND APPARATUS FOR CURING CONCRETE PRODUCTS

Paul L. Lovell, Logan, Iowa, assignor to Cyclamatic, Inc., Cedar Rapids, Iowa

Continuation of Ser. No. 125,661, March 18, 1971, abandoned. This application June 12, 1975, Ser. No. 586,425
Int. Cl.[2] F27B 9/16; F26B 19/00
U.S. Cl. 432—138 4 Claims



1. Apparatus for curing concrete products which comprises:
means forming an endless circular tunnel having a floor, walls, and a ceiling, said tunnel substantially airtight except for a product loading station at one portion thereof;
means forming a track on the floor of said tunnel;
a plurality of upstanding, interconnected racks movably mounted on said track, each rack including a solid upright wall panel extended transversely across said tunnel

and including further vertically spaced shelves capable of cooperating with identical shelves of an adjacent rack to support pallets for carrying products to be cured;

first sealing means secured about the periphery of each said rack;

second sealing means secured at predetermined arcuately spaced locations on the inside of said tunnel and cooperable with said first sealing means to form a substantially airtight seal therewith, such that with a rack panel located momentarily at a said location a substantially complete airtight seal is provided completely across the said tunnel;

means for moving said interconnected racks about said tunnel;

said first and second sealing means coacting to form four separate arcuately arranged stations within said tunnel between said product loading station and a product unloading station;

means connected to said tunnel means for introducing steam into a first of said stations and for maintaining said steam in a turbulent manner therein, said first station being maintained at a certain temperature;

means connected to said tunnel means for introducing steam into a second of said stations adjacent said first station and for circulating said steam therein, said second station being maintained at a temperature higher than the temperature of said first station;

means forming separate openings in said tunnel means for the entrance of air of ambient temperature into a third of said stations adjacent said second station, and for the egress of said air from said third station to the atmosphere; and

means connected to said tunnel means for forcing air of ambient temperature into a fourth of said stations adjacent said third station, and said tunnel means having formed therein an opening at said fourth station for the egress of said forced air therefrom.

3,982,891

BLEACHING AND DETERGENT COMPOSITIONS HAVING IMIDE ACTIVATOR AND PEROXYGEN BLEACH

Leo Thomas Murray, East Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 314,100, Dec. 11, 1972, Pat. No. 3,928,223, which is a continuation-in-part of Ser. No. 134,451, April 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 677,747, Oct. 24, 1967, abandoned. This application Sept. 18, 1975, Ser. No. 614,571

Int. Cl.[2] D06L *3/02*; C11D *3/395*

U.S. Cl. 8—111 15 Claims

1. A bleaching composition consisting essentially of a water soluble peroxygen bleaching compound selected from the group consisting of perborates, percarbonates, persulfates, persilicates, perphosphates, hydrogen peroxide and sodium peroxide; and a water soluble imide having the formula R_1—COOR wherein R represents a C_1 to C_4 alkyl or phenyl and R_1 represents an acyclic imide radical, an imide nitrogen atom of which is bonded directly to the depicted —COOR moiety, the mol ratio of imide to peroxygen compound ranging from 0.01 to 2.0.

3,982,892

ACTIVATED PEROXY BLEACH COMPOSITION

Frederick W. Gray, Summit, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed July 12, 1974, Ser. No. 487,889

Int. Cl.[2] D06L *3/02*, *3/06*; C11D *7/54*

U.S. Cl. 8—111 35 Claims

1. An activated peroxy compound bleaching composition comprising a peroxy bleaching compound and a mixture of activators for such compound, at least one of which is (a) an activator selected from the group consisting of di-lower alkanoyl di-lower alkyl glyoxime, tetra-lower alkanoyl glycoluril and mixtures thereof and at least another of which is (b) an activator selected from the group consisting of 2-[di(2-hydroxy-lower alkyl)amino]-4,6-dihalo-s-triazine, 2,4-di-lower alkoxy-6-halo-s-triazine and mixtures thereof, the ratio of active oxygen available from said peroxy bleaching compound to said mixture of activators for such compound being in the range of about 1:12 to 5:1, and the ratio of activator (a) to activator (b) being in the range of about 1:5 to 5:1.

3,982,893

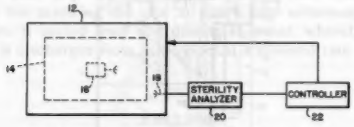
STERILIZER CONTROL METHOD AND APPARATUS

Larry James Joslyn, Walworth, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Filed Sept. 8, 1975, Ser. No. 611,397

Int. Cl.[2] A61L *3/02*; G01N *25/56*

U.S. Cl. 21—2 8 Claims



8. A method for controlling the operation of a sterilizer comprising the steps of:

a. placing RF radiating means within a load to be sterilized and then placing the load into a sterilizing chamber;

b. continuously monitoring a plurality of sterilizing affecting environmental conditions within the sterilizing chamber including at least humidity and temperature by sensor means located within the load, the sensor means being capable of issuing a continuous sensor signal which is representative of each of the sensed conditions;

c. modulating the RF signal of said radiating means in response to said sensor signal;

d. conveying said modulated RF signal outside of said sterilizing chamber; and

e. operating a sterilizer control means responsive to the modulated RF signal conveyed to the outside of said sterilizing chamber.

3,982,894

METHOD OF INHIBITING ACIDIC CORROSION OF FERROUS METALS WITH POLYQUATERNARY AMINO POLYMERS

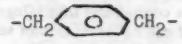
Robert R. Annand, St. Louis, and Aldred E. Woodson, Festus, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Dec. 22, 1971, Ser. No. 211,049

Int. Cl.[2] C23F *11/00*, *11/04*, *11/14*

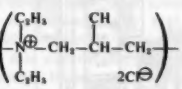
U.S. Cl. 21—2.7 R 7 Claims

1. A process of inhibiting corrosion of metals including ferrous metals and alloys thereof in an acidic corrosive medium which comprises contacting said metals including ferrous metals and alloys thereof in said corrosive medium with a polyquaternary amino polymer prepared by reacting a monoamine with an organic dichloride, with or without final alkylation by a quaternizing agent, said polyquaternary amino polymer having at least about 10% of the polymer units with quaternary amino units, said organic dichloride having the general formula Cl—R—Cl and R is $-CH_2)_n$ where n is 2–10, $-CH_2CH=CHCH_2-$, $-CH_2C\quad CCH_2-$,



or $-CH_2CH_2-O-CH_2CH_2-$.

6. A process of inhibiting corrosion of metals including ferrous metals and alloys thereof in an acidic corrosive medium which comprises contacting said metals including ferrous metals and alloys thereof in said corrosive medium with a polyquaternary amino polymer prepared by reacting diethylamine with epichlorohydrin, with or without final alkylation by a quaternizing agent, said polyquaternary amino polymer having at least about 10 percent of the polymer units with quaternary amino units and having recurring units of the idealized formula



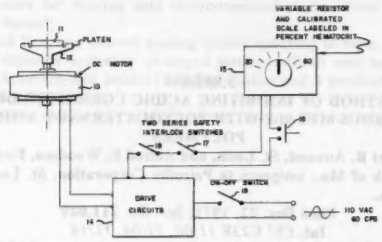
7. A process of inhibiting corrosion of metals including ferrous metals and alloys thereof in an acidic corrosive medium which comprises contacting said metals including ferrous metals and alloys thereof in said corrosive medium with a polyquaternary amino polymer prepared by reacting still-bottom polyethylene polyamines containing primary, secondary, tertiary amino groups and heterocyclic amines with 1,4-dichlorobutene, with or without final alkylation by a quaternizing agent, said polyquaternary amino polymer having at least about 10 percent of the polymer units with quaternary amino units.

3,982,895

BLOOD SMEARED SLIDE CENTRIFUGE

Lynn G. Amos, Raleigh, N.C.; James W. Bacus, Hinsdale, Ill.; Robert C. Beaty, and Charles H. Rogers, both of Raleigh, N.C., assignors to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 363,432, May 24, 1973, Pat. No. 3,906,890. This application June 18, 1974, Ser. No. 480,506
Int. Cl.² G01N 33/16
U.S. Cl. 23—230 B 4 Claims



1. A method of preparing blood films for microscopic examination comprising

determining the red blood cell concentration of a quantity of blood,

placing a said quantity of blood on one flat surface of a microscope slide,

providing a centrifuge,

providing a manually-adjustable variable control,

spinning said slide in said centrifuge with said one surface of said microscope slide perpendicular to the spin axis of said centrifuge, and

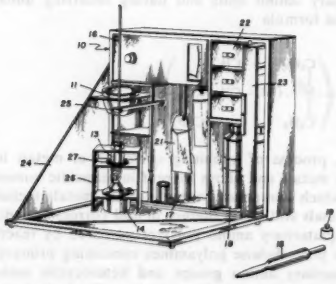
controlling the time integral of the centrifugal force applied to said microscope slide by said centrifuge by adjusting with said variable control said time integral as a function of said red blood cell concentration of said blood.

3,982,896

TEST METHOD FOR DETERMINING ZEOLITE

Charles A. Keisling, Boylston, and Leonard B. Sand, Holden, both of Mass., assignors to Zeochem Corporation, Worcester, Mass.

Filed Nov. 4, 1974, Ser. No. 520,296
Int. Cl.² G01N 25/00, 25/20; G01G 3/08
U.S. Cl. 23—230 R 2 Claims



1. A test method for determining the amount of zeolite material in a sample, comprising the sequential steps of

a. separating a specific mass of the sample,

b. heating the mass to a temperature sufficient to desorb adsorbed water,

c. isolating the heated mass from the atmosphere,

d. cooling the isolated and heated mass,

e. adding a specific quantity of adsorbable liquid to the mass,

f. noting the rise in temperature of the mass and liquid mixture, and

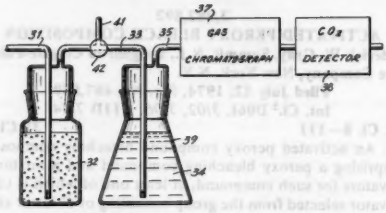
g. correlating the rise in temperature to the amount of zeolite material in the sample.

3,982,897

FILTER AND DETECTOR AND METHODS OF USING SAME IN THE REMOVAL AND DETECTION OF CARBON MONOXIDE FROM, AND IN, A GAS STREAM

Israel Herbert Scheinberg, 5447 Palisade Ave., Bronx, N.Y. 10471

Continuation-in-part of Ser. No. 292,011, Sept. 25, 1972, which is a continuation-in-part of Ser. No. 151,153, June 8, 1971, abandoned, which is a continuation-in-part of Ser. No. 102,869, Dec. 30, 1970, Pat. No. 3,693,327, which is a continuation-in-part of Ser. No. 85,057, Oct. 29, 1970, abandoned. This application Feb. 19, 1976, Ser. No. 659,199
Int. Cl.² A24B 15/02; B01D 39/04; G01N 31/14, 33/16
U.S. Cl. 23—232 R 41 Claims



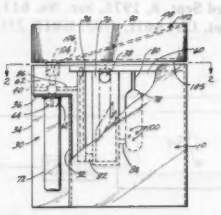
32. A method of absorbing CO from a gas stream, comprising the step of passing said gas stream through a container containing a composition including packed red blood cells therein.

3,982,898

APPARATUS FOR COLLECTING URINE SAMPLE

Bernard McDonald, 7700 Seville Ave., Huntington Park, Calif. 90255

Filed Jan. 8, 1976, Ser. No. 647,606
Int. Cl.² A61B 5/00, 10/00; G01N 1/00, 33/16
U.S. Cl. 23—259 12 Claims



1. Urine testing device comprising:

a housing having an open planar top,

a funnel member mounted on the top of the housing,

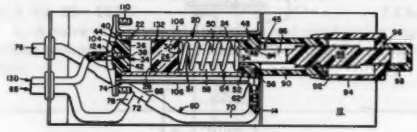
means removably securing the funnel member to the housing, the funnel having a bottom surface overlying the open top of the housing and forming a cover for the housing, the funnel member having a passage extending into the housing for directing fluid from the funnel member into the housing, a plurality of sample compartments in the housing, and means directing fluid to said sample compartments from said passage.

3,982,899

FLUID HANDLING APPARATUS

Everett F. Kelm, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed May 22, 1975, Ser. No. 579,961
Int. Cl.[2] B01L *3/02*; G01N *1/10, 1/14*
U.S. Cl. 23—259 7 Claims



1. An apparatus for aspirating a selected quantity of liquid into a pipetting vessel having an open top end and an open bottom tip and for discharging said quantity of liquid from said vessel comprising, a vessel for transferring a selected quantity of liquid having an open top end and an open bottom tip for admitting and discharging said liquid; socket means for removably engaging said open top end of said vessel; a tube, having one end connected to said socket means, for supplying suction and thereafter pressure to said vessel top end; a cylinder having a dispensing end and a driving end; plug means for sealing said cylinder dispensing end, said plug means having a passageway formed therethrough connected to said tube; a piston member within said cylinder in a sliding fluid-tight relationship with said cylinder, said piston member having a dispensing face opposing said plug means within said cylinder dispensing end and a driving face opposing said cylinder driving end, with a portion of the cylinder between said piston driving face and said cylinder driving end forming a driving chamber; spring means within said driving chamber abutting said piston driving face for urging said piston toward said cyinder dispensing end; means for supplying subatmospheric pressure to said driving chamber to withdraw said piston against said spring means and toward said cylinder driving end, thereby aspirating liquid into said vessel through the bottom tip thereof; means for stopping the withdrawal of said piston at a predetermined distance from said cylinder dispensing end, said distance being predetermined to cause said vessel to be partially filled with said selected quantity of liquid; means for selectively venting the subatmospheric pressure supplied to said driving chamber to permit said spring means to urge said piston toward said cylinder dispensing end, thereby discharging said selected quantity of liquid from said vessel; and, said venting means including flow restrictive means for metering the rate at which said subatmospheric pressure is vented from said driving chamber, whereby said liquid is discharged from said vessel at a metered rate.

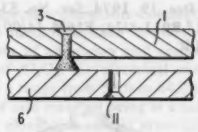
3,982,900

PLATE FOR FLUID-BED REACTORS

Giansilvio Malgarini, and Edoardo Pasero, both of Rome, Italy, assignors to Centro Sperimentale Metallurgico S.p.A., Rome, Italy

Filed June 16, 1975, Ser. No. 587,236
Claims priority, application Italy, June 17, 1974, 51565/74
Int. Cl.[2] F26B *25/10*; B01J *8/44*
U.S. Cl. 23—284 7 Claims

1. A plate for fluid bed reactors, comprising spaced upper and lower plates having holes therethrough, the holes in the upper plate being staggered relative to the holes in the lower plate, said holes having frusto-conical enlargements at one end thereof, the frusto-conical enlargements of the holes in the upper plate being at the upper ends of the holes of the upper plate and the frusto-conical enlargements of the holes



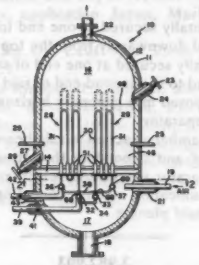
of the lower plate being at the lower ends of the holes of the lower plate.

3,982,901

HEAT TRANSFER ELEMENT AND TUYERE FOR FLUIDIZED BED REACTOR

Andrew Beaumont Steever, Old Greenwich, and Walfred Wilhelm Jukkola, Westport, both of Conn., assignors to Dorr-Oliver Incorporated, Stamford, Conn.

Filed June 25, 1975, Ser. No. 590,141
Int. Cl.[2] F28D *13/00*
U.S. Cl. 23—284 12 Claims



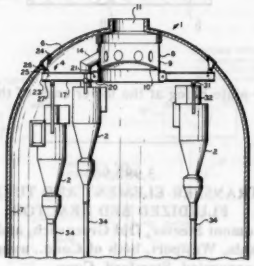
1. A fluid bed reactor comprising a reaction chamber, a windbox separated from said reaction chamber by a constriction plate, a body of particulate solids subject to fluidization on said constriction plate, a plurality of heat exchanger coils comprising vertically oriented runs of tubing serially joined by upper and lower return bends, said vertical runs of tubing passing through said constriction plate and located in contact with said body of particulate solids for heat exchange with said solids in the fluidized state, said lower return bends located below said constriction plate, a plurality of elongated tuyere means in said constriction plate and extending into said reaction chamber having the combined functions of admitting fluidizing gas through said constriction plate into said reaction chamber, providing access through said constriction plate for said vertical runs of heat exchange tubing, supporting said vertical runs of tubing and providing thermal sleeves to accommodate differential thermal expansion between said constriction plate and said vertical runs of tubing, said tuyeres each having therein an outer annular gas passageway for fluidizing gas, said vertically oriented tubing runs each having a segment thereof within and traversing said tuyeres, an insulating lining on each of said segments constituting the inner surface of said annular gas passageway, said tuyeres being fixed and bonded at the lower ends thereof to said constriction plate, and secured at the upper ends thereof in a bonded joint to said vertical runs of tubing for support thereof.

3,982,902

IMPLEMENT SUPPORT APPARATUS

Russell W. Lortz, Borger, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 19, 1974, Ser. No. 534,284
Int. Cl.² B01J *8/24;* **F16M** *11/00, 13/00*
U.S. Cl. 23—288 R **5 Claims**



1. Apparatus comprising:
a. a vessel having an opening in the top thereof;
b. a plenum attached to the top of said vessel and depending therefrom, said plenum being in communication with said opening;
c. a bracket secured to said vessel at a point spaced from said plenum;
d. a beam pivotally secured at one end to said plenum at a point spaced downwardly from the top of said vessel;
e. a link pivotally secured at one end of said bracket and at the other end to the second end of said beam so that said beam is disposed in a generally horizontal plane;
f. a cyclone separator;
g. a support member attached to said beam between the two ends thereof and depending therefrom to support said cyclone separator within said vessel; and
h. fluid communication means connecting an outlet of said cyclone to said plenum.

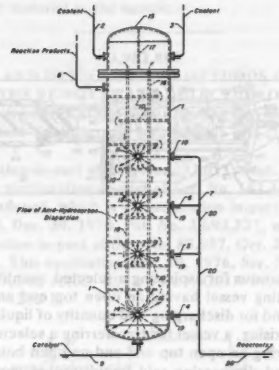
3,982,903

ALKYLATION REACTION CHAMBER

Robert F. Anderson, La Grange Park, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 462,071, April 18, 1974, Pat. No. 3,914,111. This application July 14, 1975, Ser. No. 595,839
The portion of the term of this patent subsequent to Oct. 21, 1992, has been disclaimed.
Int. Cl.² B01J *1/00, 8/08;* **C07C** *3/54*
U.S. Cl. 23—288 E **3 Claims**

1. An acid-catalyzed alkylation reaction chamber which comprises, in combination:
a. a vertically-disposed, elongated cylindrical vessel having internal heat removal means;
b. an acid inlet port at the lower end of said vessel and a reaction product outlet port at the upper end of said vessel;
c. a plurality of vertically spaced reactant stream inlet ports disposed along said vessel between said acid inlet port and said reaction product outlet port;
d. a plurality of vertically spaced baffles within said vessel perpendicular to the longitudinal axis thereof, said baffles dividing the inner volume of said vessel into compartments, and said baffles having circular segment-shaped openings at alternate sides of said vessel to provide a serpentine flow of liquid upwardly through the vessel; and
e. a plurality of reactant injection assemblies within said vessel, each disposed between a pair of adjacent baffles, within a compartment, and communicating with one of said reactant stream inlet ports, said injection assemblies comprising spray nozzles oriented to direct spray into substantially all portions of said compartment in which said injection assembly is situated.

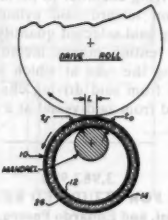


3,982,904

METAL RINGS MADE BY THE METHOD OF PARTICLE RING-ROLLING

Harbhajan S. Nayar, Plainfield, N.J., assignor to Viking Metallurgical Corporation, Verdi, Nev.

Division of Ser. No. 374,184, June 27, 1973, Pat. No. 3,834,003, which is a continuation-in-part of Ser. No. 303,160, Nov. 2, 1972, abandoned. This application Apr. 23, 1974, Ser. No. 463,231
Int. Cl.² B22F *3/00, 5/00*
U.S. Cl. 29—182 **17 Claims**



1. A metal-worked product of essentially seamless annular configuration comprising a coherent mass of metallurgically bonded particles which has been hot ring rolled to achieve complete densification between a drive roll and a mandrel wherein the drive roll has a larger diameter than the mandrel, and wherein the outer diameter of said annular configuration at least exceeds the thickness as measured in the direction of its principal axis.

3,982,905

POROUS VALVE SEAT MATERIALS FOR INTERNAL COMBUSTION ENGINES

Makoto Osawa, Tokyo; Yoshitoshi Hagiwara, Niiza; Takao Kawakita, Itami; Kenya Motoyoshi, Itami, and Nobuhito Kuroishi, Itami, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo and Sumitomo Electric Industries, Ltd., Osaka, both of, Japan

Filed Dec. 28, 1973, Ser. No. 429,300

Claims priority, application Japan, Jan. 11, 1973, 48-6185

Int. Cl.² C22C *1/08, 1/05, 1/04*

U.S. Cl. 29—182.5 7 Claims

1. A valve seat material for an internal combustion engine, which comprises a sintered ferrous alloy having the composition:

	percent by weight
chromium	5–15
cobalt	5–20
nickel	2–8
tungsten	2–10
molybdenum	0.2–12
carbon	0.2–2

the remainder being iron except for usual impurities and trace elements,

and having a porosity of 5–25 %.

3,982,906

PRODUCTION OF ALUMINUM-ALUMINUM OXIDE DISPERSION COMPOSITE CONDUCTIVE MATERIAL AND PRODUCT THEREOF

Masataka Hirai; Toshio Takahashi; Kishio Arita; Goro Yamauchi, and Shugo Kubo, all of Tokai, Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Japan

Filed Nov. 14, 1973, Ser. No. 415,801

Int. Cl.² B22F *3/00;* C22C *21/00*

U.S. Cl. 29—182.5 9 Claims

1. A method of manufacturing an aluminum-aluminum oxide dispersion composite conductive material comprising the steps of:

compacting aluminum powder with an average grain size ranging from 44 to 100 microns with a compacting pressure ranging from 0.5 ton/cm² to 3 tons/cm², the particles of said aluminum powder having a superficial aluminum oxide film; and

heat treating the resultant compacted material in an atmosphere under a reduced pressure ranging from 10^{-4} to 10^{-2} Torr at a temperature ranging from 660° to 700°C for a period ranging from 0.5 hour to 1.5 hours, with the compacted material maintaining its shape and size during the heat treatment.

5. A method of manufacturing an aluminum-aluminum oxide dispersion composite conductive material comprising the step of:

compacting a dilute aluminum alloy in the form of powder with an average grain size ranging from 44 to 100 microns with a compacting pressure ranging from 0.5 to 3 tons/cm², said dilute aluminum alloy containing at least one metal element in a group consisting of silicon, zirconium, titanium and manganese, the content of the metal element being 1.6 weight percent in case of silicon, 0.28 weight percent in case of zirconium, 1.0 weight percent in case of titanium and 1.8 weight percent in case of manganese, said dilute aluminum alloy powder being prepared by the atomization method with its particles having a superficial aluminum oxide film; and

heat treating the resultant compacting material under a reduced pressure ranging from 10^{-4} to 10^{-2} Torr at a temperature ranging from 660° to 700°C for a period ranging from 0.5 to 1.5 hours, with the compacted material maintaining its shape and size during the heat treatment.

8. Al-Al_2O_3 dispersion composite conductive material manufactured by the method defined in claim 1, the composite material consisting of aluminum and containing 0.01 to 0.2 weight percent of Al_2O_3, the electrical conductivity of said material being in a range from 58.0 to 64.0 percent IACS, the tensile strength of said material being in a range from 18 to 30 kg/mm², and the elongation of said material being in a range from 2.5 to 3 percent.

9. Al-dilute alloy-Al_2O_3 dispersion composite conductive material manufactured by the method defined in claim 5, the composite material consisting of an alloy composed of aluminum containing 0.01 to 0.2 weight percent of Al_2O_3 with respect to aluminum and a slight quantity of at least one element in a group consisting of silicon, zirconium, titanium and manganese, the electrical conductivity of said material being in a range from 57.0 to 64.0 percent IACS, the tensile strength of said material being in a range from 20 to 40 kg/mm², and the elongation of said material being 3 percent.

3,982,907

HEAT AND WEAR RESISTANT SINTERED ALLOY

Uichi Honma, Kawagoe, Japan, assignor to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Division of Ser. No. 343,991, March 22, 1973, abandoned. This application Oct. 31, 1974, Ser. No. 519,709

Claims priority, application Japan, Mar. 30, 1972, 47-31141

Int. Cl.² C22C *1/05, 29/00*

U.S. Cl. 29—182.7 1 Claim

1. A valve seat formed of a sintered alloy comprising, in percent by weight, 0.2–2.0% carbon, 2.0–9.9% chromium, 0.3–1.5% molybdenum, 3.0–10.0% cobalt, 0.5–5.0% tungsten with the balance, totalling 100 weight percent, being substantially Fe, said carbon being present as carbides of other elements in said alloy and said chromium forming carbide with carbon and tungsten in said alloy.

3,982,908

NICKEL-GOLD-COBALT CONTACT FOR SILICON DEVICES

Anthony Francis Arnold, Ringoes, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 20, 1975, Ser. No. 633,690

Int. Cl.² B32B *15/04;* H01L *29/46*

U.S. Cl. 29—195 7 Claims

1. A contact for a silicon device comprising a layer of sintered nickel directly on said silicon device; a layer of gold directly on said layer of sintered nickel; and a layer of cobalt directly on said layer of gold.

3,982,909

NITROGEN-CONTAINING COLD FLOW IMPROVERS FOR MIDDLE DISTILLATES

William C. Hollyday, Jr., Watchung, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Feb. 13, 1975, Ser. No. 549,753

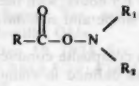
Int. Cl.² C10L *1/22*

U.S. Cl. 44—66 14 Claims

1. A fuel oil composition comprising a major amount of a middle distillate fuel oil, and a cold flow improving synergistic mixture of:

A. in the range of about 0.005 to 0.5 weight percent of a nitrogen compound selected from the group consisting of:

a. N,N-dialkyl n-alkane amides of the formula



wherein R is C_1 to C_{30} alkyl group, and R_1 and R_2 are each C_8 to C_{24} straight chain alkyl groups; and

b. C_4 to C_{10} hydrocarbyl aliphatic dicarboxylic acid wherein one of said carboxylic acid groups is reacted with either C_{14} to C_{36} aliphatic hydrocarbyl alcohol or a secondary alkyl monoamine having C_{10} to C_{24} straight chain alkyl groups, to thereby form a monoester or a monoamide, and the other of said carboxylic acid groups is reacted to form an amide or salt with a secondary alkyl monoamine having C_{10} to C_{24} straight chain alkyl groups; and at least one other additive selected from the group consisting of:

B. in the range of 0.002 to 0.2 weight percent of an ethylene backbone pour point depressant which is a copolymer of 4 to 20 molar proportions of ethylene and a molar proportion of unsaturated ester of the general formula:

wherein R_1 is hydrogen or methyl, and R_2 is a $-OOCR_4$ or $-COOR_4$ group wherein R_3 is hydrogen or $-COOR_4$ and R_4 is hydrogen or a C_1 to C_{18} alkyl group, said copolymer having a number average molecular weight in the range of about 1,000 to 50,000; and/or

C. in the range of about 0.005 to 0.30 weight percent of waxy material selected from the group consisting of:

a. amorphous hydrocarbon fraction having a number average molecular weight of about 600 to 3000, a melting point in the range of about 25° to 60°C., and having no more than about 5 weight percent of normal paraffins;

b. akylated aromatic formed by reacting paraffins of about 12 to about 50 carbon atoms, chlorinated to about 5 to 25 weight percent chlorine, with an aromatic hydrocarbon selected from the group consisting of phenol and naphthalene; and

c. microcrystalline wax.

3,982,910

HYDROGEN-RICH GAS GENERATOR

John Houseman, Pasadena, and Donald J. Cerini, Flintridge, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed July 10, 1974, Ser. No. 487,156

Int. Cl.² B01J 7/00

U.S. Cl. 48—61 **17 Claims**

1. A hydrogen generator comprising

means for defining a source of liquid hydrocarbon,

means for defining a source of air,

means establishing a partial oxidation region,

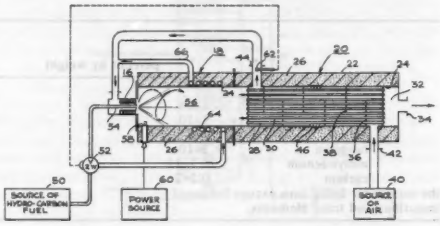
means to which said means defining a source of liquid carbon is connected for producing a spray of droplets from said liquid hydrocarbon source and injecting said spray into said partial oxidation region,

means for injecting air from said means defining a source of air into said partial oxidation region to be mixed with said spray,

means to which said partial oxidation region is connected for igniting said air-spray mixture to permit production of hot hydrogen-rich product gases,

means to which said means defining a source of air is connected for preheating air from said source prior to its injection into said partial oxidation region with said hot hydrogen-rich product gases,

means coupled to said means for preheating air for determining when the temperature of said preheated air exceeds a predetermined value and producing a signal,



means coupled to said means defining a source of liquid hydrocarbon for vaporizing said liquid hydrocarbon,

valve means responsive to said signal for terminating the application of liquid hydrocarbon from said source to said means for producing a spray of droplets and for directing it instead to said means for vaporizing liquid hydrocarbon to produce vaporized hydrocarbon,

means for directing said vaporized hydrocarbon to said means for injecting air to be mixed with said preheated air and injected therewith into said partial oxidation regions, and

means for removing hydrogen-rich product gases from said partial oxidation region.

3,982,911

PROCESS FOR THE PREPARATION OF A COMPOSITE CUBIC BORON NITRIDE LAYER ABRASIVE BODY

Minyoung Lee, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 302,809, Nov. 1, 1972, abandoned. This application Oct. 18, 1974, Ser. No. 515,867

Int. Cl.² B24D 3/06, 3/14; C04B 31/16

U.S. Cl. 51—307 **18 Claims**

1. A process for the preparation of a composite abrasive body comprising the steps of:

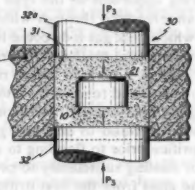
a. placing within a protective metal container (1) a layer of a mass of clean cubic boron nitride crystals, (2) a layer of bonding alloy or metal for providing said bonding alloy for infusing and wetting the clean surfaces of capillary-size voids in said mass of cubic boron nitride crystals, said bonding alloy being a metal alloy having a critical wetting temperature of less than about 1500°C, being capable of reducing B_2O_3 and exhibiting a limited finite reactivity with cubic boron nitride, the amount of said bonding alloy ranging from about 30 to 60% by volume of said mass of cubic boron nitride crystals, and (3) a layer of substrate material different from said bonding alloy, said substrate material being selected from the group consisting of (a) metal carbide powder selected from the group consisting of tungsten carbide, titanium carbide, tantalum carbide and mixtures thereof containing sintering metal bonding agent therefor selected from the group consisting

of cobalt, nickel, iron and mixtures thereof sinterable at operating temperature and pressure, (b) sintered metal carbide selected from the group consisting of tungsten carbide, titanium carbide, tantalum carbide and mixtures thereof, and (c) metal having a linear thermal expansion coefficient of less than about 10×10^{-6} inch per inch degree Centigrade and having a melting point at the operating pressure greater than the operating temperature and being selected from the group consisting of molybdenum, niobium, platinum, chromium, vanadium, tungsten, tantalum, titanium, silicon, rhodium, ruthenium, zirconium and alloys thereof, said substrate being disposed with one side facing said other two layers,

b. disposing said metal container and the contents thereof within a finely-divided particulate pressure-transmitting medium that remains unsintered under the operating conditions of temperature and pressure and that transmits applied pressure substantially undiminished,

c. applying substantially isostatic pressure to said container and said contents via said pressure transmitting medium, said pressure being greater than about 20,000 psi and significantly less than the pressure at which cubic boron nitride is stable at the operating temperature selected for this step, the application of pressure being maintained at least long enough to substantially stabilize the dimensions of said container and said contents at least in planes through said container parallel to the interface between the layers of bonding alloy or bonding alloy-providing metal and the cubic boron nitride crystals,

d. simultaneously applying substantially isostatic pressure to and heating said container and said contents as substantially dimensionally stabilized in step (c), said heating being to a temperature and for a period of time in excess of about one minute to liquefy said bonding alloy or said bonding alloy-providing metal, exceed the critical wetting temperature of said bonding alloy and permit infusion thereof into capillary-size voids in said mass of cubic boron nitride crystals, said pressure being applied via said pressure-transmitting medium and reaching a value between at least about 500psi and a value significantly less than the pressure at which cubic boron nitride is stable at said critical wetting temperature,



e. maintaining substantially isostatic pressure on said container and said contents during cooling thereof and

f. recovering the resultant composite abrasive body in which a layer of bonding alloy-bonded cubic boron nitride crystals is directly bonded to a substrate.

15. A composite abrasive body consisting of a layer of bonding alloy-bonded cubic boron nitride crystals directly bonded to a metal substrate having a linear thermal expansion coefficient less than about 10×10^{-6} inch/inch °C, said metal substrate being selected from the group consisting of molybdenum, niobium, platinum, chromium, vanadium, tungsten, tantalum, titanium, silicon, rhodium, ruthenium, zirconium and alloys thereof, and the bonding alloy component of said layer of bonding alloy-bonded cubic boron niitride crystals being characterized as a metal alloy having a critical wetting temperature of less than about 1500°C, exhibiting a limited finite reactivity with cubic boron nitride and being capable of reducing B_2O_3, said bonding alloy component ranging from about 30 to 60% by volume of the cubic boron nitride crystals.

3,982,912

METHOD FOR PREPARATION OF AN IMPROVED K-A TYPE ZEOLITE AND FOR SEPARATION BY ADSORPTION POLAR AND NON-POLAR MOLECULES

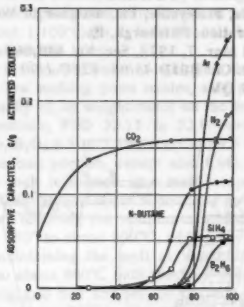
Yoshifumi Yatsurugi, 6-507, 7-ban, 2-chome, Tsujido-Nishikaigan, Fujisawa, Kanagawa; Tatsuo Kuratomi, 2-18, 4-chome, Hamatake, Chigasaki, Kanagawa, and Tetsuo Takaishi, 1461-251, Nagae, Hayamacho, Miuragun, Kanagawa, all of Japan

Continuation-in-part of Ser. No. 221,469, Jan. 27, 1972, abandoned, and a continuation-in-part of Ser. No. 368,966, June 11, 1973. This application May 6, 1974, Ser. No. 467,123

Claims priority, application Japan, Mar. 31, 1971, 46-18697; Oct. 2, 1971, 46-76817

Int. Cl.[2] B01D *15/00*

U.S. Cl. 55—35 **4 Claims**



1. A process for removal of phosphine from a mixture of monosilane and phosphine which comprises contacting said mixture with an improved K–A type zeolite in which approximately 33.3 to 83.3% and approximately 16.7 to 66.7% of potassium ion and zinc ion, respectively, are ion exchanged.

3,982,913

METHOD AND APPARATUS FOR DEGASSING METALLIC MELTS

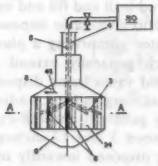
Heinrich Feichtinger, Schaffhausen, Switzerland, assignor to Leybold-Heraeus-Verwaltung G.m.b.H., Cologne, Germany

Filed Dec. 5, 1973, Ser. No. 421,755

Claims priority, application Switzerland, Dec. 7, 1972, 17872/72

Int. Cl.[2] B01D *19/00*

U.S. Cl. 55—55 **12 Claims**



1. A method for degassing metallic melt comprising the steps: immersing a rotating member in the melt, said member having step-shaped portions in the form of a back tooth with a rising inclined surface; rotating said member in such a direction of rotation that the rising inclined surface runs ahead;

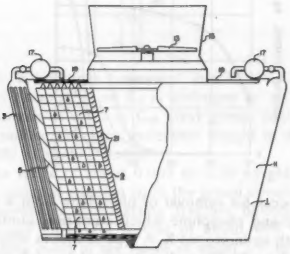
forming vacuum spaces in recesses of said step-shaped portions during rotation of said member, said vacuum spaces being free of melt; admitting a processing gas into said vacuum spaces for carrying away gases extracted from said melt and passed into said vacuum spaces, said processing gas flowing through said vacuum spaces and carrying away said extracted gases in the flow of said processing gas; and removing the diluted extracted gas from said melt, said processing gas being conducted to said vacuum spaces through channels and openings in said rotating member, said processing gas being throttled for maintaining a vacuum of 0.1 to 500 torr in said vacuum spaces, said rotational member having channels for admitting auxiliary processing gas to said vacuum spaces.

3,982,914

DRIFT ELIMINATORS FOR EVAPORATIVE COOLING TOWERS

Ralph E. Grimble, Finleyville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 7, 1974, Ser. No. 448,860
Int. Cl.² B01D *45/08*; F28C *1/00*
U.S. Cl. 55—257 QV **5 Claims**



1. A cooling tower which brings water in direct contact with cooling air, said cooling tower having a pair of generally imperforate end walls, a louvered wall extending between said end walls at one side of said cooling tower; fill disposed inwardly of said louvered wall and generally extending between said end walls, said fill being disposed to break up influent water to increase its surface area and bring it into intimate contact with influent cooling air, whereby some of the moisture is entrained in the air to produce moisture laden air; a pan disposed above said fill to distribute water over said fill; a venturi shaped stack disposed above and connected to said cooling tower; a fan disposed in said stack so as to draw cooling air through said louvered wall and fill and exhaust said air through said stack; and a drift eliminator disposed inwardly of said fill, said drift eliminator comprising a plurality of elongated curved vanes which generally extend longitudinally between said end walls, said vanes being disposed in a single row and having longitudinal margins form leading and trailing edges which are joined by generally smooth curved surfaces having an arc length between 3 and 12 inches, said leading edges of said vanes being disposed inwardly of said fill in a plane forming an acute angle generally less than 20° with a vertical plane, siad vanes being disposed in a generally parallel relationship, each vane comprising an upper and lower surface of different radii, the radius of curvature of the lower surface being smaller than the radius of curvature of the upper surface, and the upper and lower surface having an included angle greater than 45° but less than 90° to define a continuous smooth curved flow path which changes direction between 45° and 90° and said vanes having their leading and trailing edges and the curved surfaces contiguous therewith generally tangent to the moisture laden air leaving the fill and flowing toward the stack, whereby a large portion of the moisture in the air is collected on the vanes and the pressure drop across the vane is minimal.

3,982,915

APPARATUS AND METHOD FOR CONTROLLING FLOODING IN THE DRAWING OF GLASS FIBERS

Charles H. Coggin, Jr., 1330 E. Foothill, Apt. 56, Glendora, Calif. 91740

Filed Dec. 8, 1975, Ser. No. 638,526
Int. Cl.² C03B *37/02*, *37/08*
U.S. Cl. 65—1 **16 Claims**

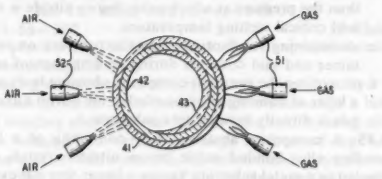
12. A method of controlling flooding from a first orifice of a glass fiber drawing apparatus of the type having a non-tip plate with a flat undersurface through which the orifice extends and against which bulk gas is directed to cool fiber being drawn from the orifice, said method comprising extending a second orifice through said plate in paired relationship to the first orifice and so positioned relative thereto that in the event of breakage of a glass fiber being drawn from the first orifice the glass therefrom will flood to and join glass being drawn from the second orifice prior to flooding to any other orifices within the plate or cooling sufficiently to prevent the continued drawing of the glass from the first orifice.

3,982,916

METHOD FOR FORMING OPTICAL FIBER PREFORM

Stewart Edward Miller, Locust, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 24, 1975, Ser. No. 644,136
Int. Cl.² C03B *23/04*, *37/02*
U.S. Cl. 65—3 A **12 Claims**



1. In a method of manufacturing a preform which is intended to be subsequently drawn into an optical fiber, said method being of the type that includes the steps of:

flowing a vapor mixture including at least one compound, glass-forming, precursor together with an oxidizing medium through a hollow, cylindrical substrate; and

heating said substrate and contained vapor mixture with a moving heat source, external to the substrate, such that a suspension of particulate, oxidic reaction product material is produced within the substrate, said particulate

material traveling downstream and coming to rest on the inner surface of said substrate and thereat being fused to form a continuous glassy deposit on said inner surface, the improvement which comprises:

adding a dopant to said glass-forming precursor thereby to alter the refractive index of said particulate material;

asymmetrically heating said substrate to preferentially deposit said doped particulate material as a continuous glassy deposit on at least one first region of said inner surface;

removing the dopant from said glass-forming precursor;

inverting the asymmetry of said asymmetrical heating to preferentially deposit said undoped particulate material as a continuous glassy deposit on at least one second region of said inner surface, said second region being substantially diametrically opposed from said first region; and then,

terminating the process when said glassy deposit has attained a predetermined thickness.

3,982,917

METHOD OF INCREASING THE STRENGTH OF SILICATE GLASS LASER RODS

Lee O. Upton, Sturbridge, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 4, 1975, Ser. No. 546,971
Int. Cl.² C03C *15/00, 19/00*
U.S. Cl. 65—31 **2 Claims**

1. A method of increasing the strength of silicate glass laser rod that has been manufactured from a silicate host glass doped with a laser active material, cut to a rod shape, and subsequently ground and polished with an abrasive material to remove the larger cutting marks and imperfections, said method which produces a hardened surface that protects the silicate glass laser rod from physical abrasions, prevents failure due to thermal shock, and removes flaws while not interfering with light pumping through the sides of the silicate glass laser rod comprising;

i. providing silicate glass laser rod that has been prepared by cutting said rod to a predetermined dimension having a predetermined length to diameter ratio range about 4.0 to about 5.3.

ii. preparing said silicate glass laser rod for an acid polishing procedure by first subjecting said provided rod to an abrasive grinding and polishing procedure employing an abrasive with grit of about 180 mesh size that removes all incipient fractures that result from or include cutting tool marks, embedded surface inclusions, shatter marks, and uneven strain distribution;

iii. washing said prepared rod with soap and water and rinsing rod with water; and then,

iv. completing a predetermined number of immersing and rinsing cycles that includes plunging said washed and rinsed rod into an acid polishing solution and sloshing said rod up and down for a period of time of about one minute, removing said rod from said acid polishing solution and water rinsing said rod of reaction products, said acid polishing solution comprised of 50 percent concentrated hydrofluoric acid containing about 48 percent HF and 50 percent concentrated nitric acid containing about 70 percent HNO_3.

3,982,918

PROCESS FOR PREPARING A COPPER CONTAINING SEALING GLASS

Rudolf G. Frieser, Poughkeepsie; Jimmie L. Powell, and Rao R. Tummala, both of Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 28, 1975, Ser. No. 572,036
Int. Cl.² C03B *9/00, 23/20, 5/16;* **C03C** *3/00*
U.S. Cl. 65—66 **5 Claims**

1. A process for forming a copper oxide containing sealing glass composition comprising the steps of:

forming a first portion of said glass, including the relatively high melting point oxides, said portion consisting essentially of, by weight based on the total weight of said composition; PbO 32.15 to 32.9%, Al_2O_3 1 to 2%, ZnO 10.5 to 12.5%, SiO_2 2 to 3%, Bi_2O_3 0 to .75%, B_2O_3 6.5 to 7.5%, in the absence of CuO by heating said first portion until homogeneous melt is formed at a melt temperature of about 1,100°C for at least about 1 hour and no more than about 1¼ hour;

forming a second portion of said glass, including the relatively low melting point oxides, said portion consisting essentially of, by weight based on the total weight of said composition; PbO 32.15 to 32.9 percent, Bi_2O_3 0 to 0.75%, B_2O_3 6.5 to 7.5%, and CuO 3.5 to 5% by heating said second portion, except said CuO, until a homogeneous melt is formed at a melt temperature of about 1050°C for at least about ¾ hour and not more than about 1 hour, reducing the temperature of said melt to from about 750° to about 800°C, adding the CuO to the melt and maintaining the melt at temperatures from about 750° to about 800°C until the melt is homogeneous;

combining said first and second portions at a temperature of from about 750° to about 800°C and maintaining the resulting combined melt of said first and second portions at a temperature of from about 750° to about 800°C until said melt is homogeneous, and

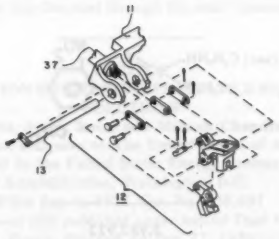
cooling said melt to produce a glass composition in which the conversion of CuO to Cu_2O is below about 10% by weight.

3,982,919

RETROFIT IMPROVEMENTS IN TONG HEAD ASSEMBLIES

William Wenz, 427 Carlton Ave., Millville, N.J. 08332

Filed Sept. 30, 1975, Ser. No. 618,234
Int. Cl.² C03B *9/44*
U.S. Cl. 65—172 **2 Claims**



1. In glass molding equipment employing a pneumatically operated take-out tong head assembly of the type utilizing a centrally disposed cylinder with included piston and piston rod assembly operating a cross head which, in turn, simultaneously operates at least two spring biased plunger assemblies each interconnected for operation of a scissors tong assembly mounted in a tong holder guide bracket, the improvements for repair and alteration of the assembly comprising:

a pneumatic cylinder assembly including a cylinder, piston and piston rod adapted for direct mounting of the cylin-

der upon the tong holder guide bracket and direct interconnection of the piston rod to the scissors tong assembly following removal of the original cross head and plunger assemblies; and

means pneumatically interconnecting the pneumatic cylinder with the original centrally disposed cylinder whereby the original pneumatic control to the tong head assembly will be transmitted to the pneumatic cylinders for independent for independent operation of the scissor tong assemblies.

3,982,920

STABILIZED DISPERSIONS OF MICRONUTRIENTS IN SPRAY OILS

Edward A. Cross, Houston, Tex., and John Douglas Downer, Pointe-a-Pierre, Trinidad, West Indies, assignors to Texaco Inc., New York, N.Y.

Filed Dec. 2, 1974, Ser. No. 528,967

Int. Cl.² C05F *11/00*

U.S. Cl. 71—1 **4 Claims**

1. A composition self-emulsifiable with a horticultural spray oil and efffective for supplying micronutrients to the leaves of plants, comprising in combination a non-phytotoxic hydrocarbon mineral oil having a gravity API of 27–35, a viscosity at 100°F of 70 to 104 Saybolt Universalt Seconds and a boiling point between about 600° and 775°F.; an emulsifying agent serving also as a stabilizer and consisting of an alkylaryl-polyether alcohol and a water-soluble inorganic salt of the group of calcium, copper, molydenum, magnesium, zinc, manganese and iron.

3,982,921

ORGANO PHOSPHORUS HERBICIDES

Takeo Satomi, Takarazuka; Kunio Mukai, Nishinomiya; Akihiko Mine; Naganori Hino, both of Toyonaka; Kohshi Tateishi, and Masachika Hirano, both of Minoo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

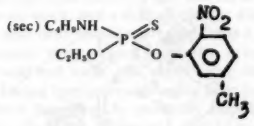
Division of Ser. No. 474,444, May 29, 1974, Pat. No. 3,936,433, and a continuation-in-part of Ser. No. 182,523, Sept. 21, 1971, abandoned. This application Dec. 24, 1974, Ser. No. 536,220

Claims priority, application Japan, Sept. 25, 1970, 45-84432

Int. Cl.² A01N *9/36*

U.S. Cl. 71—87 **4 Claims**

1. A method for controlling weeds, which comprises applying an effective amount of a compound of the formula:



3,982,922

HERBICIDAL COMPOSITIONS CONTAINING FURANCARBOXAMIDES

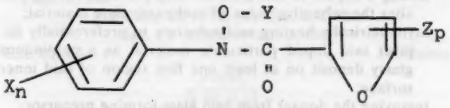
John Krenzer, Oak Park, and Sidney B. Richter, Chicago, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 694,075, Dec. 28, 1967, abandoned. This application Feb. 12, 1971, Ser. No. 115,077

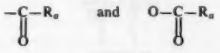
Int. Cl.² A01N *9/00*

U.S. Cl. 71—88 **1 Claim**

1. A herbicidal composition comprising an inert carrier and, in a herbicidally toxic amount, at least one compound of the formula



wherein n is an integer of from 1 to 3; X is selected from the group consisting of halogen, alkyl or alkenyl of from 1 to 5 carbon atoms, nitro, hydroxy, alkoxy of from 1 to 5 carbon atoms,



where R_a is an alkyl group of from 1 to 5 carbon atoms and cyano; Y is selected from the group consisting of alkyl of from 1 to 5 carbon atoms,

where R_a is an alkyl group of from 1 to 5 carbon atoms, alkoxycarbonyl, wherein the alkoxy group is from 1 to 5 carbon atoms, alkylthiocarbonyl wherein the alkyl group is from 1 to 5 carbon atoms, alkoxycarbonylalkylene, wherein the alkoxy and alkylene groups are from 1 to 5 carbon atoms, and carbamoyl; Z is selected from the group consisting of halogen, alkyl of from 1 to 5 carbon atoms, alkoxy of from 1 to 5 carbon atoms and nitro; and p is an integer of from 0 to 3.

3,982,923

GEM-BIS AMIDE HERBICIDE ANTIDOTE COMPOSITIONS AND METHODS OF USE

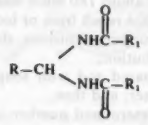
Eugene G. Teach, El Cerrito, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 363,464, May 24, 1973, Pat. No. 3,923,494. This application May 22, 1975, Ser. No. 580,126

Int. Cl.² A01N *9/12*

U.S. Cl. 71—100 **15 Claims**

1. An herbicide composition comprising a mixture of a herbicidally effective amount of a thiocarbamate herbicide and an antidote compound corresponding to the formula



in which R is selected from the group alkyl, containing from 1 to 6 carbon atoms, inclusive; alkenyl, containing from 2 to 6 carbon atoms, inclusive; phenalkenyl, in which the alkenyl contains from 2 to 4 carbon atoms, inclusive; and cyanoalkyl, containing from 2 to 6 carbon atoms, inclusive; and R_1 is lower chloroalkyl containing from 1 to 4 carbon atoms, inclusive; from about 0.01 to about 15 parts by weight of antidote compound for each part by weight of the thiocarbamate herbicide.

3,982,924

PROCESS FOR PRODUCING CARBIDE ADDITION AGENTS

Frederick H. Perfect, Wyomissing, Pa., assignor to Reading Alloys, Inc., Robesonia, Pa.

Division of Ser. No. 147,018, May 26, 1971. This application Aug. 6, 1973, Ser. No. 385,631

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.[2] B22F *9/00*; C21C *7/00*; C22B *47/00*; C22C *1/04*

U.S. Cl. 75—.5 BA 6 Claims

1. A process for preparing carbide addition agents comprising combining in a finely-divided state

a. carbon

b. an oxide of at least one metal selected from the group consisting of vanadium and columbium, and

c. an oxide of at least one metal selected from the group consisting of iron and manganese into a uniform mixture, compacting said mixture, sintering and reducing said compact mixture at a temperature of from about 1200° to about 1400° C. under a reducing atmosphere, and about atmospheric pressure to form said carbide addition agent the proportional relationship between *a*, *b*, and *c* being such that a point representing the composition of said carbide addition agent, expressed in atomic percent, lies substantially within the area PQRS of FIG. 1.

3,982,925

METHOD OF DECARBURIZATION IN ESR-PROCESSING OF SUPERALLOYS

Wilfredo V. Venal; H. Joseph Klein; Richard R. Daniel, all of Kokomo, Ind., and Rodney T. Gross, Lockport, N.Y., assignors to Cabot Corporation, Kokomo, Ind.

Filed Apr. 9, 1975, Ser. No. 566,314

Int. Cl.[2] C22B *4/00*, *9/10*

U.S. Cl. 75—10 R 10 Claims

1. The method of electroslag remelting of nickel and cobalt base alloy materials to prevent weld heat affected zone corrosion resulting from precipitation of grain boundry carbides in such alloys comprising the step of decarburizing the ESR starting slag by adding a sufficient amount of NiO to the molten slag to react with sufficient carbon to evolve volatile oxides of carbon and reduce the carbon in the slag to the desired level prior to starting the remelting of the alloy material.

3,982,926

METHOD FOR MELTING CHARGES

Gunther Geck, Hagen, and Hans Jurgen Langhammer, Bremen-Platjgenwerbe, both of Germany, assignors to Klockner-Werke AG, Duisburg, Germany

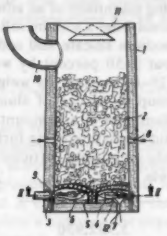
Filed May 28, 1974, Ser. No. 473,900

Claims priority, application Germany, May 26, 1973, 2327072

Int. Cl.[2] C21C *7/00*

U.S. Cl. 75—48 9 Claims

1. A melting method, comprising the steps of introducing a charge of iron scrap or iron sponge into an upright melting chamber having a bottom so as to form in said chamber a column of said charge having a leading end portion abutting said bottom and supporting the remaining portion of said column in said chamber; melting said column with an annular flame located in the region of said leading end portion and arranged intermediate said bottom and said remaining portion, said melting being performed in such a manner that said leading end portion has the form of a central projection which extends downwardly from said remaining portion to said bottom and has a cross-sectional area at substantially all locations intermediate said bottom and said remaining portion which is considerably smaller than that of said remaining portion; temporarily collecting the molten material produced by said melting at said bottom so as to form a pool of molten material which contacts said leading end portion, the heat transfer from said pool to said column being restricted due to the relatively small cross-sectional area of said leading end portion; superheating the molten material of said pool with said flame so as to prevent immediate freezing of the molten material discharged from said chamber, said superheating being beneficially influenced by the restricted heat transfer from said pool to said column; and continuously evacuating the superheated molten material from said chamber.



3,982,927

METHOD OF BLOWING TO OBTAIN A VERY LOW AMOUNT OF CARBON IN CHROME STEELS

Jean Saleil, Imphy, France, assignor to Creusot-Loire, Paris, France

Filed Jan. 23, 1975, Ser. No. 543,351

Claims priority, application France, Nov. 13, 1974, 74.37356

Int. Cl.[2] C21C *5/34*

U.S. Cl. 75—60 4 Claims

1. A method of refining a chromium-containing steel which comprises the steps of separately and simultaneously blowing into the steel, below its surface, controlled amounts of water vapour and a non-oxidizing gas to reduce loss of chromium, to reduce the carbon content of the steel to less than 0.015%, and to control the temperature of the bath, the water vapour and non-oxidizing gas each being blown into the steel through one of the two inner tubes of a nozzle comprising three concentric tubes, and a fluid for protecting the nozzle against wear is blown into the steel through the outer concentric tube.

3,982,928

SEPARATION OF URANIUM FROM $(TH,U)O_2$ SOLID SOLUTIONS

Premo Chiotti, Ames, Iowa, and Mahesh Chandra Jha, Arvada, Colo., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Jan. 3, 1975, Ser. No. 538,491

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.[2] C22B *60/02*

U.S. Cl. 75—84.1 R 7 Claims

1. A method for separating uranium values from a mixture of thorium oxide and uranium oxide comprising:

a. mixing the metal oxides with a molten chloride salt additionally containing thorium tetrachloride and thorium metal, said salt being selected from the group consisting of the salts of the alkali metals, alkaline earth metals and mixtures thereof, whereby the uranium oxide is selectively reduced to uranium metal, and

b. recovering the uranium metal.

3,982,929

COMPOSITION FOR A FLUIDIZING FLUX IN THE PRODUCTION OF IRON AND STEEL

Willis A. Heck, Brackenridge, and Roy E. Ferre, Valencia, both of Pa., assignors to ESM, Inc., Valencia, Pa.

Filed Feb. 9, 1973, Ser. No. 330,961
Int. Cl.[2] C22B 9/10
U.S. Cl. 75—94 4 Claims

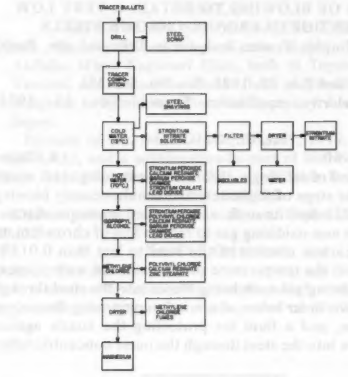
1. An acid fluidizing flux composition for the production of iron and steel consisting essentially of an admixture of particulate constituents selected from a sodium salt selected from the group consisting of sodium silicate and sodium carbonate in an amount from about 5–50 percent by weight, silica in an amount from about 20–80 percent by weight and aluminum selected from the group consisting of aluminum oxides and powdered metallic aluminum in an amount from about 2–60 percent by weight, said admixture being further characterized by constituting discrete composite particles formed from said particulate constituents.

3,982,930

METHOD FOR DISPOSAL OF TRACER BULLETS

William E. Doades, Otwell; James E. Short, Jr., Switz City, and Karen S. Whorrall, Shoals, all of Ind., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 25, 1975, Ser. No. 616,698
Int. Cl.[2] C22B 26/22
U.S. Cl. 75—101 R 4 Claims



1. A method for disposing of tracer bullets having a steel casing filled with pyrotechnic material containing strontium nitrate, magnesium, strontium peroxide, polyvinyl chloride, calcium resinate and other pyrotechnic materials, with the combined percentages of strontium nitrate and magnesium comprising at least sixty percent of the total percentage of said pyrotechnic material, comprising the steps of

first rotating said steel casing filled with pyrotechnic material against a stationarily mounted twist drill whereby said pyrotechnic material is drilled from said steel casing and falls onto a collecting tray,

then immersing the collected pyrotechnic material in water sufficiently cold to dissolve only strontium nitrate,

then decanting the water solution of strontium nitrate and evaporating the water to reclaim strontium nitrate,

then removing all materials of said tracer ammunition pyrotechnic material other than magnesium by successive washes of hot water and solvents, and

then drying the remaining magnesium for reuse as a pyrotechnic material.

3,982,931

N,N-DI-SEC.BUTYL-BENZAMIDE HERBICIDES

Emilio Arsura, Milan; Agostino Baruffini; Franco Gialdi, both of Pavia; Giovanni Pellegrini, Milan; Riccardo Ponci, Pavia, and Pietro Scrivani, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Division of Ser. No. 774,475, Nov. 8, 1968, Pat. No. 3,835,189.
This application Apr. 9, 1974, Ser. No. 459,263
Claims priority, application Italy, Nov. 9, 1967, 22494/67; Oct. 8, 1968, 222207/68
Int. Cl.[2] A01N 9/20
U.S. Cl. 71—118 7 Claims

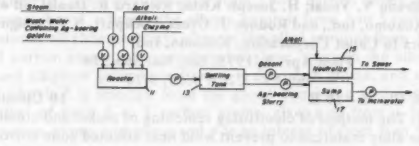
1. A composition for selectively inhibiting the growth of undesirable plants infesting soil planted with agrarian cultures, said composition containing an effective amount of a mixture of dichloro-:N,N-di-sec.butylbenzamide, containing 70% of 2,5-dichloro, 23% of 2,3-dichloro and 7% 3,4-dichloro and an inert carrier.

3,982,932

RECOVERY OF SILVER FROM GELATINOUS PHOTOGRAPHIC WASTES

Matyas Korosi, Montmorency, Victoria, Australia, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 22, 1972, Ser. No. 282,819
Int. Cl. C22b 11/00
U.S. Cl. 75—118P 9 Claims



1. A process for recovering silver in the form of silver metal or compounds from waste wash waters of emulsion manufacture comprising:

mixing with said wash waters a proteolytic enzyme endopeptidase which is a bacterial enzyme prepared from *Bacillus subtillis* and which is further characterized by the ability to react with gelatin to produce a peptide,

maintaining said wash waters at an alkaline pH during reaction of said enzyme therewith;

introducing acid into said wash waters in sufficient amount to develop an acid pH corresponding to the isoelectric point thereby to effect the precipitation of silver metal or compounds and forming a supernatant liquid, and

separating a concentrate of silver metal or compounds and said supernatant liquid from one another.

3,982,933

BRASS ALLOY

Günther Rudolph, Neuberg; Erhard Schelzke, Neu-Isenburg, and Antonio Leogrande, Werdohl, all of Germany, assignors to Vereinigte Deutsche Metallwerke AG, Frankfurt am Main, Germany

Filed Oct. 31, 1973, Ser. No. 411,471
Claims priority, application Germany, Nov. 2, 1972, 2253690
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976
Int. Cl.[2] C22C 9/04
U.S. Cl. 75—156.5 5 Claims

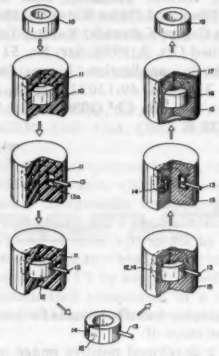
1. A brass alloy with improved machinability consisting essentially of 57 to 62% by weight copper, 1 to 4% by weight lead, 0.15 to 0.20% by weight magnesium, 0.15 to 0.20% by weight tin and the balance zinc.

3,982,934

METHOD OF FORMING UNIFORM DENSITY ARTICLES FROM POWDER METALS

Joseph M. Wentzell, Remsen, N.Y., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 31, 1974, Ser. No. 474,878
Int. Cl.² B22F 3/00, 3/12, 3/14, 3/16
U.S. Cl. 75—208 R 16 Claims



1. A method for forming a powder metal article of uniform density comprising the steps of:

a. forming a metallic shell on form having the appropriate prepress size of the desired article, the form being made of a selectively removable material;

b. surrounding the form having the metallic shell thereon with a support media;

c. selectively removing the form from the metallic shell, the shell remaining surrounded by the support media and defining a cavity having the appropriate prepress size of the desired article;

d. filling the cavity defined by the shell with powder metal;

e. pressing the support media and filled shell to compact the powder metal into the desired article; and

f. removing the support media from the compacted article, the article having the metallic shell thereon.

3. The method of claim 1 wherein the form is provided in the appropriate prepress size of the desired article by:

a. providing a pattern having the dimensions of the desired article multiplied by the reciprocal of the cube root of the tap density of the powder metal to be formed;

b. forming a female mold around the pattern;

c. removing the female mold from the pattern, the mold having developed the desired strength and having a cavity in the shape of the pattern;

d. filling the mold cavity with casting material;

e. solidifying the casting material in the mold cavity; and

f. removing the formed casting from the mold, the casting having the shape of the pattern.

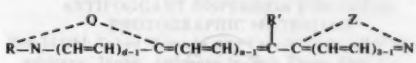
3,982,935

ELECTROPHOTOGRAPHIC COPYING PROCESS

Richard F. Bartlett, Burlington, and Laura K. Case, Winchester, both of Mass., assignors to Itek Corporation, Lexington, Mass.

Division of Ser. No. 855,026, Sept. 3, 1969, Pat. No. 3,879,197. This application Aug. 1, 1974, Ser. No. 494,013
Int. Cl.² G03G 13/22, 5/06
U.S. Cl. 96—1 R 1 Claim

1. In a process for producing a visible image on an electrophotographic medium including the steps of exposing the electrophotographic medium to an image pattern of activating radiation, charging said electrophotographic medium to provide a latent electrostatic image pattern, and developing the electrostatic image pattern, the improvement wherein said electrophotographic medium comprises a conductive support having thereon a photoconductive coating formed from a photosensitive material dispersed in an organic binder having a specific resistivity of greater than 10^9 ohm-cm and wherein said photosensitive material consists essentially of a cyanine dye base and an organic halogen derivative capable of formation of hydrohalide acid upon illumination with light, said cyanine dye base corresponding to the formula



wherein *d* and *e* each represent a positive integer of from 1 to 2; *n* represents a positive integer of from 1 to 4; R represents an organic radical selected from the group consisting of alkyl, aralkyl and aryl groups; R' represents hydrogen or a cyano group; and Q and Z each represent the nonmetallic atoms necessary to complete a heterocyclic organic nucleus containing from 5 to 6 atoms in the ring.

3,982,936

DEFORMATION IMAGING SYSTEM

William L. Goffe, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 695,074, Jan. 2, 1968, Pat. No. 3,542,545, which is a continuation-in-part of Ser. No. 520,423, Jan. 13, 1966, abandoned. This application June 15, 1970, Ser. No. 46,070
Int. Cl.² G03G 13/22
U.S. Cl. 96—1.1 61 Claims

1. An imaging method comprising the steps of:

a. providing an imaging member comprising a fracturable, laterally relocatable layer overlying a softenable, electrostatically deformable layer; and

b. imagewise electrostatically deforming said deformable layer, prior to and without any substantial migration of fracturable, laterally relocatable layer material in depth in said softenable, electrostatically deformable layer, to disrupt and fracture said fracturable layer whereby portions of said fracturable layer laterally relocate with respect to said deformable layer to move from the peaks of the deformations to agglomerate in the pockets of the deformations.

3,982,937

ELECTROPHOTOGRAPHIC RECORDING MATERIAL

Wolfgang Wiedemann, Geisenheim-Johannisberg, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Filed July 12, 1974, Ser. No. 488,212
Claims priority, application Germany, July 16, 1973, 2336093
Int. Cl.² G03G 5/04
U.S. Cl. 96—1.5 19 Claims

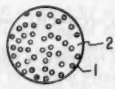
1. An article which comprises an electrically conductive carrier layer, a layer comprising a material selected from the group consisting of selenium or selenium-tellurium, and, on the side of the selenium or selenium-tellurium layer remote from the carrier layer, a layer comprising an oligomeric condensation product of 3-bromopyrene and formaldehyde having a degree of polycondensation of 6 to 10.

3,982,938

PHOTOCONDUCTIVE TONERS WHICH INCLUDE PHOTOCONDUCTIVE PIGMENT PARTICLES IN A CHARGE-TRANSPORTING INSULATING BINDER

Satoru Honjo; Hajime Miyatuka, and Seiji Matsumoto, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Feb. 12, 1974, Ser. No. 441,861
Claims priority, application Japan, Feb. 13, 1973, 48-17715
Int. Cl.² G03G 5/04
U.S. Cl. 96—1.5 14 Claims



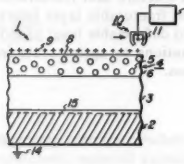
1. Photoconductive toner particles, each particle consisting of a mixture of photoconductive pigment particles and a charge-transporting insulating binder within which is dispersed said photoconductive pigment particles, said insulating binder being capable of transporting charge carriers when the charge carriers are injected therein from said pigment and being selected from the group consisting of (a) resins sensitized by a Lewis acid, (b) resins having organic photoconductive material dissolved therein and (c) organic photoconductive polymers, the volume of said pigment in said toner being 2 to 30 volume percent of said toner and said charge-transporting binder being substantially transparent to light in the spectrally-sensitive region of said pigment.

3,982,939

MULTIPLE LAYER MIGRATION IMAGING SYSTEM

Lloyd F. Bean, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 309,546, Nov. 24, 1972, which is a continuation-in-part of Ser. No. 76,891, Sept. 30, 1970, abandoned. This application Mar. 31, 1975, Ser. No. 563,892
Int. Cl.² G03G 5/04
U.S. Cl. 96—1.5 32 Claims



1. An imaging member, comprising:
a. a first layer of softenable material;
b. a second layer having softenable material and migration material; and
c. at least a third layer having softenable material and migration material; said second layer being sandwiched between said first and third layers, and said softenable materials in said first, second and third layers capable of having their resistance to migration of migration material decreased sufficiently to allow migration in depth in said first, second and third layers of said migration materials in said second and third layers.

9. The imaging member of claim 1 wherein at least one of said second and third layers has its respective migration material dispersed as particles throughout the bulk of its respective softenable material.

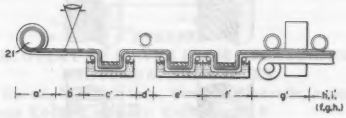
13. An imaged member, comprising:
a. a layer of softenable material; and
b. and image within said softenable material layer comprising migrated first and second migration materials the relative positioning of which, one to the other, is inverted with respect to their relative positioning prior to imaging.

3,982,940

PROCESS FOR THE FORMATION OF IMAGES

Kikuo Kinjo; Hiroshi Matsuno, both of Tokyo; Tetsuo Hasegawa, Hino, and Hideo Kato, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1974, Ser. No. 511,756
Claims priority, application Japan, Oct. 5, 1973, 48-112141; Jan. 31, 1974, 49-13022; Feb. 8, 1974, 49-15964
Int. Cl.² G03C 5/04
U.S. Cl. 96—27 R 14 Claims



1. A photographic transfer process for transferring an image comprising the steps of:
1. forming a developed positive image of an original on a film-forming photosensitive layer provided on a support which is at least semi-transparent, said photosensitive layer being separated from and adhered to said support by a first adhesive high polymeric protecting layer which is at least semi-transparent and which is releasably adhered to said support;
2. disposing the resulting photosensitive layer bearing said positive image in a face-to-face relationship with and at a distance from a substrate composed of a hydrophobic polymer;
3. introducing a dye transferring solvent into the space between the image-bearing photosensitive layer and the surface of said substrate, said solvent being capable of dissolving the coloring matter forming said image; and
4. heating the solvent in said space by dielectric heating to dissolve said image and transfer it onto the surface of said substrate.

3,982,941

PHOTOPOLYMERIZABLE PASTE COMPOSITIONS AND THEIR USE

Harold Kirkwood Inskip, Newark, Del., assignor to E. I. Du Pont De Nemours & Company, Wilmington, Del.

Division of Ser. No. 357,525, May 7, 1973. This application Feb. 7, 1975, Ser. No. 547,958
Int. Cl.² G03C 7/00, 5/00, 1/94, 1/68
U.S. Cl. 96—34 6 Claims

1. A process for preparing sintered or fused films of inorganic materials on substrates comprising the steps of:
a. screen printing a paste composition comprising:
1. about 20 to about 80 weight percent of finely divided inorganic material;
2. about 0.5 to about 5 weight percent of at least one photopolymerizable monomer;
3. about 0.01 to about 2 weight percent of organic sensitizer;
4. about 1 to about 15 weight percent of polymeric binder, and,
5. from 10 to about 75 weight percent of a substantially saturated hydrogenated solvent containing 10 to about 40 carbon atoms formed by the hydrogenation of a terpenoid solvent to form a film,
b. imagewise exposing said film through a mask or transparency to actinic radiation to photopolymerize the mono-

mers in the paste composition and cause hardening of the composition in the exposed areas,

c. removing the unexposed and unhardened areas of said film from said substrate, and

d. firing said film to decompose or burn the polymeric binder and photopolymerized monomers and sinter or fuse the inorganic particulate material to form functional electronic circuit elements.

3,982,942

PHOTOPOLYMERIZATION OF ETHYLENICALLY-UNSATURATED ORGANIC COMPOUNDS

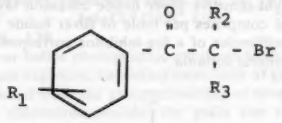
Robert T. Lu, Wilmington, Del., assignor to ICI United States Inc., Wilmington, Del.

Filed Mar. 16, 1973, Ser. No. 341,992

Int. Cl.² G03C *5/00, 1/68;* **C08F** *8/00, 2/46*

U.S. Cl. 96—35.1 **8 Claims**

1. A process for the photopolymerization of ethylenically unsaturated organic compounds which comprises irradiating a photopolymerizable composition comprising an ethylenically unsaturated compound and a photosensitizing composition comprising a blend of from 0.05 to 5% by weight, based on the weight of ethylenically unsaturated compound, of $Mn_2(CO)_{10}$ and from 0.1 to 5% by weight, based on the weight of ethylenically unsaturated compound, of a co-catalyst selected from the group consisting of a compound characterized by the formula



wherein R_1 is —H, —Br, or $—CH_3$, R_2 is —H or $—CH_3$, and R_3 is —H or $—CH_3$; cumene; diisopropyl benzene; alkyl mercaptans containing from 10 to 16 carbon atoms; thiourea; and mixtures thereof, wherein the weight ratio of co-catalyst to $Mn_2(CO)_{10}$ is from 0.2 to 10, with light having a wavelength from 4,000 to 7,000 angstroms.

3,982,943

LIFT-OFF METHOD OF FABRICATING THIN FILMS AND A STRUCTURE UTILIZABLE AS A LIFT-OFF MASK

Bai C. Feng, Wappingers Falls, N.Y.; Richard H. Flachbart, Brookfield Center, Conn.; Leonard J. Fried, and Harold A. Levine, both of Poughkeepsi, N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Mar. 5, 1974, Ser. No. 448,327

Int. Cl.² G03C *5/00, 3/00*

U.S. Cl. 96—38.4 **16 Claims**

1. A method of depositing patterned thin films on an inorganic substrate comprising:

forming on said substrate, a bottom layer of positive photoresist material,

forming over said bottom layer, a discrete light-transparent top layer of positive photoresist material which is less solubilized in developer by exposure to light than is the material in said bottom layer,

simultaneously exposing said layers to the same selected pattern of light,

applying developer for said photoresist materials to said top and bottom layers to thereby form an aperture pattern through said top layer corresponding to said light pattern and a corresponding aperture pattern through said bottom layer coincident with and laterally wider than said top layer apertures, and

depositing said thin films onto said substrate through said coincident aperture patterns using said photoresist layers as a deposition mask.

3,982,944

ANTIFOGGANT DISPERSION FOR COLOR PHOTOGRAPHIC MATERIALS

Reiichi Ohi; Takeo Shimada, and Yasushi Oishi, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Feb. 6, 1975, Ser. No. 547,681

Claims priority, application Japan, Feb. 6, 1974, 49-15106

Int. Cl.² G03C *7/00*

U.S. Cl. 96—56 **9 Claims**

1. An antifoggant dispersion for silver halide photographic materials comprising a hydrophilic colloid medium dispersion of a solution of a mixture of 2,5-bis(1',1'-dimethylbutyl)hydroquinone and at least one other aliphatic hydrocarbon group-substituted hydroquinone in a high-boiling organic solvent.

3,982,945

DEVELOPMENT OF SILVER HALIDE EMULSIONS

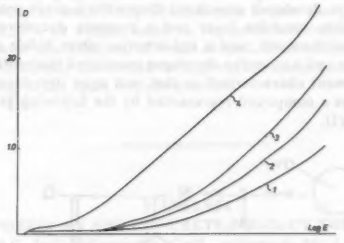
Jozef Frans Willems, Wilrijk, Belgium, assignor to AGFA-GEVAERT, N.V., Mortsel, Belgium

Filed Mar. 24, 1975, Ser. No. 561,659

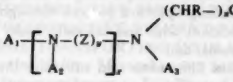
Claims priority, application United Kingdom, Apr. 3, 1974, 14802/74

Int. Cl.² G03G *5/30*

U.S. Cl. 96—66 R **14 Claims**



1. Method of producing photographic silver images by development of a photographic element having a layer containing developable silver halide wherein the developer at the time of development includes an organometallic complex of a metal capable of changing its valency and an aliphatic aminocarboxylic acid, or a water-soluble salt thereof; said aliphatic aminocarboxylic acid corresponds to the formula:



wherein:

M represents a cation,

R represents hydrogen, alkyl, substituted alkyl, aryl, substituted aryl, aralkyl or substituted aralkyl,

y is 0 or 1,

n is a positive integer,

x represents 0 or provided y is 1 may be a positive integer, each of A_1, A_2 and A_3 (the same or different) represents hydrogen, alkyl or substituted alkyl, and

Z represents alkylene or alkylene-phenylene-alkylene, the amino group(s) in the molecule being secondary or teritiary amino groups and the molecule containing at least one hydroxyl group in one or more of A_1, A_2, A_3, R and Z.

3,982,946

BIS-AZO PYRAZOLONE TYPE DYE DEVELOPER AND LIGHT-SENSITIVE MATERIAL

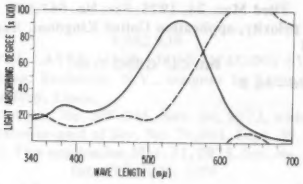
Yukio Maekawa, and Seiki Sakanoue, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Feb. 10, 1975, Ser. No. 548,838

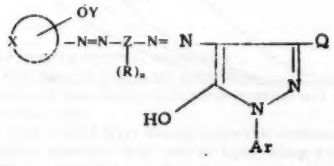
Claims priority, application Japan, Feb. 8, 1974, 49-16026

Int. Cl.² G03C *1/76, 1/40, 7/00, 1/10*

U.S. Cl. 96—73 **14 Claims**

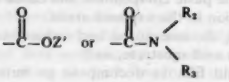


1. In a light-sensitive material comprising a support having thereon a blue-sensitive silver halide emulsion layer and a yellow dye developer associated therewith, a green-sensitive silver halide emulsion layer and a magenta dye developer associated therewith, and a red-sensitive silver halide emulsion layer and a cyan dye developer associated therewith, the improvement characterized in that said cyan dye developer comprises a compound represented by the following general formula (I):



(I)

wherein X represents the atoms necessary for completing a monocyclic or polycyclic aromatic group; Y represents an acyl group having 1 to 4 carbon atoms; Ar and Z each represents a phenyl nucleus or a naphthalene nucleus, with Ar being connected either directly or through a divalent atom or group to a polyhydric phenol moiety having a silver halide developing action; R represents an alkyl group or an alkoxy group; *n* represents an integer of 0 to 4; and Q represents



wherein Z′ represents a hydrogen atom or an alkyl group, R_2 and R_3 each represents a hydrogen atom or an aliphatic group, or R_2 and R_3 can combine to form a divalent aliphatic group.

3,982,947

FOG-INHIBITORS FOR SILVER HALIDE PHOTOGRAPHY SILVER HALIDE PHOTOGRAPHIC MATERIAL CONTAINING AN IODO BENZENE COMPOUND AS ANTIFOGGANT

Robert Joseph Pollet, Vremde, and Antoon Leon Vandenberghe, Hove, both of Belgium, assignors to AGFA-GEVAERT, N.V., Mortsel, Belgium

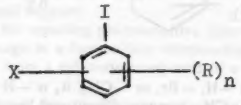
Filed Feb. 27, 1975, Ser. No. 553,622

Claims priority, application United Kingdom, Mar. 14, 1974, 11462/74

Int. Cl.² G03C *1/34*

U.S. Cl. 96—109 **4 Claims**

1. A photographic material comprising a support and at least one light-sensitive silver halide emulsion layer wherein the material comprises per mole of silver halide from about 0.1 to 10 millimoles of a fog-inhibitor corresponding to the following general formula:



wherein:

X is a silver salt forming hydroxy or carboxy group or a hydroxy or carboxy precursor group or a silver salt or silver complex forming substituent azole heterocycle,

n is 1 to 4, and

R stands for hydrogen or a member selected from the group consisting of alkyl, alkoxy, fused-on benzene, aryl, halogen, alkoxycarbonyl, sulpho in acid or salt form, or a group as represented by X.

3,982,948

PROCESS FOR PREPARING SILVER HALIDE EMULSION CONTAINING A RHODIUM SALT AND A DECOMPOSITION PRODUCT OF NUCLEIC ACID

Haruhiko Sato; Hidehiko Ishikawa, and Katsuo Mogaki, all of Odawara, Japan, assignors to Konishiroku Photo Co. Ltd., Japan

Filed June 24, 1974, Ser. No. 481,982

Claims priority, application Japan, July 2, 1973, 48-73607

Int. Cl.² G03C *1/34*

U.S. Cl. 96—109 **6 Claims**

1. A process for the preparation of silver halide photographic emulsions, characterized in that a water-soluble rhodium salt and an effective stabilizing amount of at least 20 mg per mole of silver halide of a compound taken from the class consisting of adenine, guanine, uracil, cytosine and thymine is added to a silver halide photographic emulsion prior to completion of the physical ripening thereof.

3,982,949

HALF-TONE SCREEN MAKING BY DECAPITATION OF SUBSTRATE PROJECTIONS

Edgard Reymond, Le Manoir, 1441 Montagny, Switzerland

Filed Aug. 6, 1975, Ser. No. 602,444

Claims priority, application Switzerland, Aug. 30, 1974, 11827/74

Int. Cl.² G03F 5/00

U.S. Cl. 96—116 19 Claims

1. A method of producing a screen with selected half-tone effects comprising providing a sheet of first material having an uneven face which in cross-section has a multitude of projections placed close to one another, each projection having an apex and being of progressively decreasing width up to the apex, said uneven face being covered at least partially with a second material having different light-absorbtion properties to the first material, and removing the first and second materials by decapitation of said projections to a greater depth at some areas than at other areas to selectively uncover the first material for the provision of said selected half-tone effects.

3,982,950

SILVER HALIDE PHOTOGRAPHIC EMULSION FOR USE IN FLASH EXPOSURE

Keisuke Shiba; Haruo Takei; Akira Sato, and Akira Ogawa, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

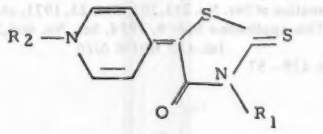
Continuation-in-part of Ser. No. 319,810, Dec. 29, 1972, abandoned. This application Feb. 4, 1975, Ser. No. 546,974

Claims priority, application Japan, Dec. 28, 1971, 46-3038

Int. Cl.² G03C 1/10

U.S. Cl. 96—139 4 Claims

1. A silver halide photographic emulsion having high sensitivity to flash exposure, consisting essentially of grains of silver halide selected from the group consisting of silver chlorobromide and chlorobromoiodide, the grain size ranging from about 0.04 to about 1 micron, said grains being chemically sensitized with a combination of a gold salt and at least one of the group VIII metal salts or a combination of a gold salt and at least one of the group II metal salts, a protective colloid, and a sensitizing amount of a simple merocyanine dye having the following formula (II),



(II)

wherein R_1 and R_2 represent an unsubstituted alkyl group, allyl group, sulfoalkyl group or carboxyalkyl group, said sensitizing dye being the only sensitizing dye present in the emulsion.

3,982,951

ALUMINUM CHROMATE PROTECTIVE COATINGS FOR ALUMINUM

Miguel Coll Palagos, Rye, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 181,207, Sept. 16, 1971, abandoned. This application Apr. 20, 1973, Ser. No. 353,159

Int. Cl.² C09D 5/08

U.S. Cl. 106—14 5 Claims

1. A composition for use in aqueous solution to impart a colorless corrosion resistant coating to aluminum and alloys thereof in which said composition consists essentially of hexavalent chromium, a fluosilicate ion, a nitrate ion, and a source of soluble barium in such amounts that when added to one liter of water there is provided about 2.5 to about 3.75 grams per liter hexavalent chromium, from about 0.75 to about 1.5 grams per liter fluosilicate ion, from about 0.71 to about 1.19 grams per liter nitrate ion, and from about 0.79 to about 1.3 grams per liter barium ion.

3,982,952

INFRARED DETECTION SYSTEM AND WINDOWS USED THEREIN

William H. Dumbaugh, Jr., Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 137,855, April 27, 1971, Pat. No. 3,911,275. This application Oct. 7, 1974, Ser. No. 512,241

Int. Cl.² C03C 3/00

U.S. Cl. 106—47 Q 5 Claims

1. A glass exhibiting substantial transmission to infrared radiation in the wavelength range of five to six microns and having a coefficient of thermal expansion of less than 80 × 10^{-7}/°C. consisting essentially in percent by weight as calculated on an oxide basis from the glass batch, of 25–50% GeO_2, 10–50% La_2O_3, 5–50% Ta_2O_5 and 2–20% ZnO, and wherein B_2O_3, SiO_2, and P_2O_5 are absent except as in impurity levels up to about 1% and divalent metal oxides other than ZnO, if present, are present in amounts less than 10%.

3,982,953

REFRACTORY CASTING, RAMMING OR STAMPING MASS

Paul Lennart Ivarsson, Hoganas, and Ingvar Gustav Axel Blom, Viken, both of Sweden, assignors to Hoganas Aktiebolag, Hoganas, Sweden

Filed Nov. 7, 1974, Ser. No. 521,874

Claims priority, application Sweden, Nov. 26, 1973, 7315942

Int. Cl.² C04B 35/02, 35/10

U.S. Cl. 106—55 7 Claims

1. In a refractory mass of the type used for casting, ramming or stamping refractory linings and for metallurgical ladles or tapping channels and composed of 60 to 95 % by weight of refractory grog and 40 to 5 % by weight of binder, the improvement which comprises said mass further containing 0.05 to 0.35 % by weight, based on the solids content of the mass without any additive, of straw-shaped, channel-forming elements equally distributed throughout the mass, whereby rapid drying of the mass is made possible.

3,982,954

POZZOLAN AND CONCRETE PRODUCT THEREOF

Carl C. Jeskey, Susanville, Calif., assignor to Mt. Lassen Cinder Company, Susanville, Calif.

Continuation of Ser. No. 236,519, March 20, 1972, abandoned, which is a division of Ser. No. 54,025, July 10, 1970, abandoned. This application Apr. 12, 1974, Ser. No. 460,311

Int. Cl.² C04B 7/02

U.S. Cl. 106—97 5 Claims

1. A concrete mixture comprising coarse aggregate, fine aggregate, and a mixture of cement and sufficient ground scoria cinder of an average particle size in the range between 2,000 to 10,000 Blaine to provide a rapid cure cement of increased tensile strength, wherein said scoria cinder is substantially of the following composition:

SiO_2	48.2
Fe_2O_3	5.0
Al_2O_3	14.8
CaO	17.4
MgO	7.0
SO_3	0.2

in parts by weight.

3,982,955

ALUMINUM OXIDE FIBERS AND THEIR PRODUCTION

Manfred Mansmann, and Ludwig Schmidt, both of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 316,311, Dec. 18, 1972, Pat. No. 3,865,599. This application Oct. 21, 1974, Ser. No. 516,831
Claims priority, application Germany, Dec. 22, 1971, 2163678
Int. Cl.² C01B 33/26
U.S. Cl. 106—307 6 Claims

1. An aluminum oxide fiber of about the following percent composition by weight:

Al_2O_3	61–98
SiO_2	1–20
P_2O_5	0–10
B_2O_3	0–10
MgO	0–5
C	0.1–4

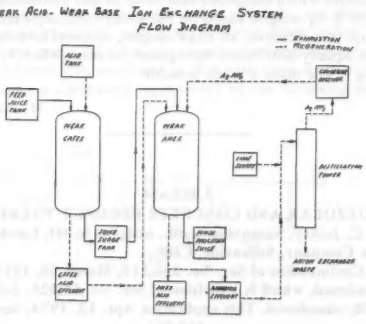
the carbon being present in amorphous form.

3,982,956

PROCESS FOR THE PURIFICATION OF IMPURE SUGAR JUICE

Karlheinz W. R. Schoenrock; Avinash Gupta, and Hugh G. Rounds, all of Ogden, Utah, assignors to The Amalgamated Sugar Company, Ogden, Utah

Filed Sept. 26, 1975, Ser. No. 617,079
Int. Cl.² C13D 3/14
U.S. Cl. 127—46 A 3 Claims



1. Process which comprises the steps of treating sugarbeet juice, after second carbonation, with the hydrogen form of a resinous carboxylic-type cation exchanger arranged in a column for the reduction of calcium ion in the juice, and thereupon passing the so-treated juice through a mass of particles of a weakly basic anion exchanger having a tertiary amine functionality and operated over the hydroxyl form.

3,982,957

SODIUM SULPHUR CELLS

Ivor Wynn Jones; Graham Robinson, and Thomas Lewis Bird, all of Chester, England, assignors to The Electricity Council, London, England

Filed Feb. 14, 1975, Ser. No. 550,072
Claims priority, application United Kingdom, Feb. 15, 1974, 4884/74
Int. Cl.² H01M 10/00
U.S. Cl. 429—163 18 Claims

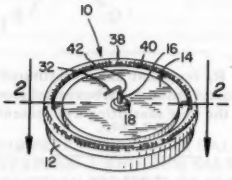
1. In a sodium sulphur cell and a tubular solid electrolyte; the improvement comprising a current collector in contact with the cathodic reactant, which current collector is formed of an impermeable carbon or graphite tube containing a deformable metallic conductor extending over and in contact with the internal surface of the tube.

3,982,958

NON-AQUEOUS BATTERY SYSTEM

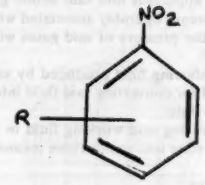
Gerald Henry Newman, Strongsville, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 211,305, Dec. 23, 1971, abandoned. This application May 9, 1974, Ser. No. 468,265
Int. Cl.² H01M 6/16
U.S. Cl. 429—57 12 Claims



1. A hermetically sealed non-aqueous battery system comprising a highly active anode selected from the group consisting of the alkali metals, alkaline earth metals and alloys of alkali metals and alkaline earth metals with one another or other metals, a cathode selected from the group consisting of metal halides, metal sulfides and metal oxides, and an electrolyte of a solute comprising a complex of at least one Lewis acid and an inorganic ionizable salt selected from the group consisting of lithium fluoride, lithium chloride, lithium bromide, sodium fluoride, sodium chloride, sodium bromide, potassium fluoride, potassium chloride, and potassium bromide, dissolved in a solvent conforming to the general for-

mula:



wherein R is selected from the group consisting of hydrogen, a halogen, an alkyl group of one to five carbon atoms, an alkoxy group of one to five carbon atoms, sulfur, an N-alkyl substituted amino group and a nitro group; said solvent being selected from the group consisting of nitrobenzene and substituted nitrobenzene compounds which exist in liquid form at ambient temperature and solid derivatives of nitrobenzene dissolved in an aromatic solvent.

3,982,959

SODIUM-SULPHUR BATTERY CELLS

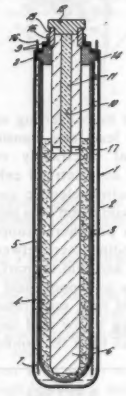
Bernard Austin Partridge, Cothill, near Abingdon; Thomas Rhys Jenkins, East Hendred, and Michael McGuire, Sinfin, all of England, assignors to The Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Mar. 7, 1975, Ser. No. 556,500

Claims priority, application United Kingdom, Mar. 11, 1974, 10835/74

Int. Cl.² H01M *10/00*

U.S. Cl. 429—163 **4 Claims**



1. A sodium-sulphur battery cell comprising a metal casing of blind-ended tubular form, a solid electrolyte of blind-ended tubular form disposed within the casing so as to define an inner compartment having sulphur as one of the cell reactants and an outer compartment having sodium as the other reactant, a carbon current collecting means of rod-like form disposed lengthwise within the inner compartment for collecting current from electro-chemical reaction between the sodium and sulphur, a packing of carbon felt disposed in the space between the current collector and the solid electrolyte and impregnated with said sulphur, means in the outer compartment adjacent to the surface of the solid electrolyte for drawing up sodium to wet those parts of the solid electrolyte above the level of sodium, a ceramic end cap supporting the solid electrolyte and joined by sealing means with the casing so as to close the sodium compartment, one end of the current collector extending through a fitting hole in the end cap so as to close the sulphur compartment, a metal connector to which said one end of the current collector is electrically connected, and sealing means joining the connector with a portion of the end cap electrically insulated from the casing.

3,982,960

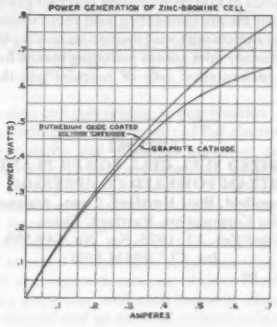
SECONDARY ELECTROCHEMICAL CELL HAVING NON-CONSUMABLE SILICON CATHODE

Howard H. Hoekje, and Paul L. Dietz, both of Akron, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 398,746, Sept. 19, 1973, abandoned. This application Mar. 31, 1975, Ser. No. 563,939

Int. Cl.² H01M *4/38*

U.S. Cl. 429—199 **11 Claims**



1. In an electrochemical cell having an anode comprising a metal chosen from the group consisting of zinc, lithium, tin, iron, and magnesium, a non-consumable cathode, an electrolyte, and means for recovering an electrical current generated therein, the improvement wherein said cathode comprises:

a silicon metal substrate having an electroconductivity greater than 100 (ohm-cm)$^{-1}$; and

an electroconductive surface other than said silicon metal on said substrate.

3,982,961

FUEL CELL STACK WITH AN INTEGRAL EJECTOR FOR REACTANT GAS RECIRCULATION

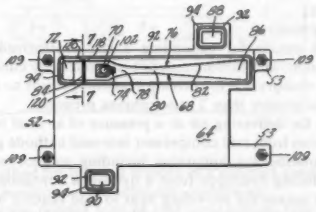
Albert P. Grasso, Vernon, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 2, 1975, Ser. No. 574,128

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.² H01M *8/06*

U.S. Cl. 429—34 **12 Claims**



1. In a fuel cell stack comprising a plurality of fuel cells each including a fuel electrode and an oxidant electrode spaced

apart defining an electrolyte compartment therebetween, means constructed and arranged with said cells to define a reactant gas space on the nonelectrolyte side of each electrode, said reactant gas spaces including a fuel gas space on the nonelectrolyte side of each fuel electrode and an oxidant gas space on the nonelectrolyte side of each oxidant electrode, each of said gas spaces having an inlet and an outlet, the improvement to said stack comprising:

an ejector for delivering and recirculating one of said reactant gases through said cells, said ejector constructed and arranged to be integral with and in heat exchange relationship with the cells of said stack, said ejector including primary inlet means, secondary inlet means, and outlet means;

first conduit means connected to said ejector primary inlet means for delivering preheated reactant gas into said ejector primary inlet means;

second conduit means connecting said ejector outlet means to said inlets of said recirculating reactant gas spaces; and

third conduit means connecting said recirculating reactant gas space outlets with said ejector secondary inlet means, said secondary inlet means including means for establishing the recirculation rate of reactant gas through said ejector.

3,982,962

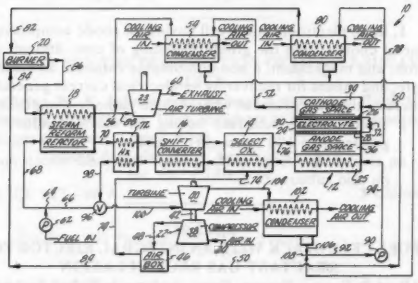
PRESSURIZED FUEL CELL POWER PLANT WITH STEAM POWERED COMPRESSOR

David P. Bloomfield, West Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Feb. 12, 1975, Ser. No. 549,599

Int. Cl.² H01M 8/06

U.S. Cl. 429—19 **12 Claims**



1. A power plant for generating electricity comprising:

a fuel cell stack including a plurality of fuel cells connected electrically in series through a load, each cell comprising a cathode electrode, an anode electrode, an electrolyte disposed therebetween, a cathode gas space on the nonelectrolyte side of said cathode electrode and an anode gas space on the nonelectrolyte side of said anode electrode;

a compressor;

turbine means for expanding a hot pressurized gaseous medium, said turbine means being operably connected to said compressor for driving said compressor to compress air to greater than 2 atmospheres pressure;

means for delivering air at a pressure of at least two atmospheres from said compressor into said cathode gas space;

fuel conditioning apparatus including reactor means for producing hydrogen from a hydrogen containing fuel;

burner means for providing heat to said reactor means;

means for delivering anode effluent gases into said burner means for providing fuel to said burner means;

means for delivering pressurized hydrogen containing fuel into said reactor means;

means for delivering pressurized hydrogen from said fuel conditioning apparatus into said anode gas space;

back pressure means operably associated with said stack for maintaining the pressure of said gases within said stack;

a working fluid;

means for transferring heat produced by said stack to said working fluid for converting said fluid into a hot, pressurized gaseous state;

means for delivering said working fluid in its hot, pressurized gaseous state into said turbine means for driving said compressor;

condenser means;

means for delivering the working fluid exhausted from said turbine means into said condenser means for converting said fluid to the liquid state; and

means for returning said working fluid from said condenser means to said means for transferring heat thereto.

3,982,963

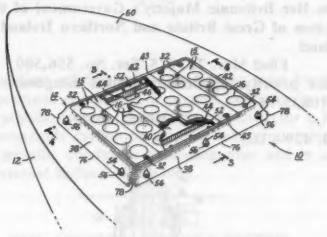
SOLAR BATTERY MAINTAINER

Edmund J. Mahoney, Billerica, and Paul S. Natanson, Lexington, both of Mass., assignors to Solar Power Corporation, Braintree, Mass.

Filed Aug. 5, 1974, Ser. No. 495,105

Int. Cl.² H01L 31/04

U.S. Cl. 136—89 **20 Claims**



1. A device for use in converting sunlight into electrical energy comprising at least one translucent panel having a plurality of individual electrically connected solar cells mounted therein and an electrical cable connected to said solar cells for conducting electric current therefrom, and means for supporting said panel on a mounting surface including a frame having a peripheral support wall and a panel support surface extending therebetween, said support wall having an upper edge and said support surface being located below said upper edge to support said panel within the confines of said peripheral wall; said frame including means for draining water entering below said support surface and between said support wall from the confines of the frame.

3,982,964

DOTTED CONTACT FINE GEOMETRY SOLAR CELL

Joseph Lindmayer, Bethesda, and James Frederick Allison, Silver Spring, both of Md., assignors to Communications Satellite Corporation (Comsat), Washington, D.C.

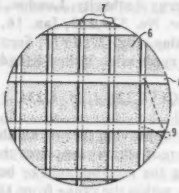
Filed Jan. 17, 1975, Ser. No. 541,827

Int. Cl.² H01L 31/02, 31/04

U.S. Cl. 136—89 **10 Claims**

1. A solar cell comprising a semi-conductor material having top and bottom surfaces and having a p-n junction at a distance of between 500 A and 2,000 A from the top semi-conductor surface thereof, said top surface having a metal oxide anti-reflective coating and being adapted to receive incident light radiation, said metal oxide coating having a fine line pattern etched therein to expose said top surface, an electrode on said bottom semi-conductor surface, and a patterned elec-

trode deposited over said etched metal oxide coating such that the patterned electrode is generally transverse to said fine line

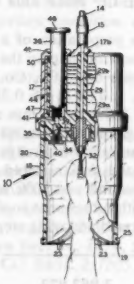


pattern to produce a plurality of point contact areas between said patterned electrode and said top semi-conductor surface.

3,982,965
WATER JET CLEANING APPLIANCE

Donald R. Spotz, 6261 SW. 5th Court, Plantation, Fla. 33317

Filed Mar. 10, 1975, Ser. No. 556,946
Int. Cl.² B08B 3/02
U.S. Cl. 134—100 15 Claims



1. In a personal cleaning appliance for using pressurized water to clean the extremities of a person's hand or foot, said appliance having:

a receptacle defining a cleaning chamber for receiving the extremity to be cleaned;

means on said receptacle at one end of said cleaning chamber for the insertion of the extremity to be cleaned;

jet nozzle means for discharging pressurized water into said cleaning chamber; and

means for connection to a water source having a water passage therethrough leading to said jet nozzle means for passing pressurized water thereto;

the improvement which comprises:

means for selectively dispensing a predetermined quantity of liquid cleaning solution into the pressurized water discharge from said jet nozzle means;

said dispensing means comprising a reservoir in said receptacle for the cleaning solution;

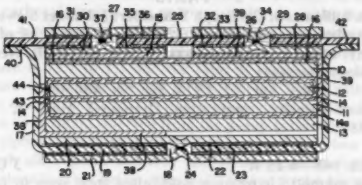
a normally-closed spring-biased check valve connected between said reservoir and said jet nozzle means to control the flow of the cleaning solution from said reservoir into the pressurized water discharge from said jet nozzle means; and

a manually operable plunger for effecting the opening of the check valve to enable the cleaning solution flow into the pressurized water discharge from said jet nozzle means.

3,982,966
ALKALINE CELL WITH DOUBLE COLLECTOR POSITIVE, NEGATIVE AND THIRD TERMINAL CONNECTIONS

Theodore R. Beatty, Bay Village, and Harry Vourlis, Lakewood, both of Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 456,838, April 1, 1974, Pat. No. 3,871,921. This application Mar. 17, 1975, Ser. No. 559,076
Int. Cl.² H01M 6/06
U.S. Cl. 429—136 15 Claims

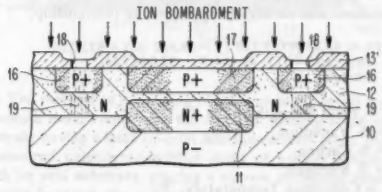


1. An alkaline cell comprising, in combination: an electrode assembly including at least one pair of flat electrode elements of opposite polarity and a porous separator containing an alkaline electrolyte; an auxiliary electrode; a liquid impervious plastic film envelop having a plurality of walls enclosing both said electrode assembly and said auxiliary electrode and having at least three openings spaced apart from one another at predetermined locations in at least one wall thereof; and a plurality of terminal connections communicating individually through said openings with said pair of electrode elements and said auxiliary electrode, with each terminal connection comprising: an internal and an external current collector overlaying said plastic film on opposite sides of an opening thereof, a thin layer of adhesive sealant, which is non-wettable by said alkaline electrolyte, for securing said internal and external current collector to said plastic film, and means for making electrical connection between the internal and external current collector through such opening.

3,982,967
METHOD OF PROTON-ENHANCED DIFFUSION FOR SIMULTANEOUSLY FORMING INTEGRATED CIRCUIT REGIONS OF VARYING DEPTHS

San-Mei Ku, Poughkeepsie; Charles A. Pillus, Wappingers Falls; Michael R. Poponiak, Newburgh, and Robert O. Schwenker, Hopewell Junction, all of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Mar. 26, 1975, Ser. No. 562,370
Int. Cl.² H01L 21/263
U.S. Cl. 148—1.5 29 Claims



1. A method for forming regions of a selected conductivity-type in a semiconductor substrate comprising

introducing dopant ions of said conductivity-type into selected regions of a surface of said substrate, and additionally bombarding at least portions of said regions with non-dopant ions having a maximum atomic number of 2,

said bombardment being carried out at a temperature below 300° C, and

heating said substrate at a temperature in the range of from 600° to 900° C sufficient to diffuse dopant ions from said regions further into said substrate and to anneal.

3,982,968

METHOD FOR THE MANUFACTURE OF A COLD-ROLLED STEEL STRIP IN THIN AND SUPER-THIN METAL PLATE THICKNESS FOR PRODUCING STRETCH-FORMED CANS OR OTHER DEEP-DRAWN PARTS

Joseph Billigmann; Christoph Schneider; Johannes Siewert, all of Andernach, and Manfred Sodeik, Neuwied, all of Germany, assignors to Rasselstein Aktiengesellschaft, Neuwied (Rhine), Germany

Filed Apr. 12, 1974, Ser. No. 460,609

Claims priority, application Germany, Mar. 7, 1974, 2410854

Int. Cl.² C23F 7/08

U.S. Cl. 148—6.15 R **3 Claims**

1. A method for treating cold-rolled steel strip to form a phosphate-coating layer on said strip and to apply a lubricant layer thereon, comprising the steps of: annealing the strip in a continuous furnace and then cooling the strip from the annealing temperature to a temperature in the range of from 50° to 120°C; applying to the strip having a temperature in said range a thin liquid coating film consisting essentially of a phosphatizing composition and an oil lubricant, said liquid coating film being capable of remaining liquid during the following coiling step; coiling the strip having said thin liquid coating film thereon to form a coil; and while the steel strip is in the coil form, cooling the coil further while utilizing the heat remaining in the coil to effect a phosphatizing reaction of said composition with said steel strip to form the phosphate coating layer on the strip.

3,982,969

LOW SILICON HIGH STRENGTH LOW ALLOY STEEL

Peter J. Koros, Pittsburgh, and John David Grozier, Bethel Park, both of Pa., assignors to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Filed Oct. 2, 1975, Ser. No. 619,099

Int. Cl.² C21D 7/14; C22C 38/06, 38/12

U.S. Cl. 148—12 F **9 Claims**

1. A killed high strength low alloy steel product having been hot-rolled to a thickness, spray cooled, and collected immediately thereafter at temperature of from 950° to 1300°F.; having a composition consisting essentially of from 0.09% to 0.22% carbon, 1.65% maximum manganese, 0.05% maximum silicon, 0.25% maximum sulfur, from 0.015% to 0.031% nitrogen, from 0.10% to 0.14% vanadium, from 0.01% to 0.10% rare earth or rare earth mixture, 0.01% to 0.09% aluminum, balance iron; said steel composition, thickness and collection temperature also satisfying the following relationship;

$$YS \leq 98{,}430+182{,}310\,(V)+80{,}662\,(C)+433{,}220\,(N)-36.7\,(CT)-26{,}184(T)-92{,}543\,(Al),$$

wherein,

YS = Yield Strength and is 88,776 p.s.i.;
V = % Vanadium;
C = % Carbon;
N = % Nitrogen;
CT = Collection Temperature, °F;
T = Hot-Rolled Thickness, inches; and
Al = % Aluminum; and

said steel product having an ultimate tensile strength of 95,000 p.s.i. minimum, a yield strength of 80,000 p.s.i. minimum and ductility as measured by percent elongation (2 inches) 18% minimum; and being substantially free of macroscopic rare earth oxy-sulfide inclusions.

3,982,970

DUCTILITY OF MOLYBDENUM AND ITS ALLOYS

Thomas Hutchinson Webster, Wantage, and Brian Leonard Eyre, Abingdon, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Continuation of Ser. No. 324,223, Jan. 16, 1973, abandoned. This application Aug. 27, 1974, Ser. No. 501,193

Claims priority, application United Kingdom, Jan. 24, 1972, 3331/72

Int. Cl.² C22F 1/18; C23C 11/10

U.S. Cl. 148—20.3 **3 Claims**

1. A method for improving the workability of molybdenum or a base alloy thereof which comprises the steps of

i. gas carburising the molybdenum or base alloy thereof at a temperature within the range from 1800°C to 2050°C to produce a carbide therein; and

ii. cooling the gas carburised molybdenum or base alloy thereof, wherein the rate of cooling immediately following the carburisation and down to 800°C is at at least 100°C/minute, thereby to produce carbide particles.

3,982,971

RARE EARTH-CONTAINING PERMANENT MAGNETS

Yoshio Yamanaka; Kazuyoshi Watanabe; Masakatsu Honshima, and Hideaki Kikuchi, all of Takefu, Japan, assignors to Shin-Etsu Chemical Co., Ltd, Tokyo, Japan

Filed Feb. 20, 1975, Ser. No. 551,157

Claims priority, application Japan, Feb. 21, 1974, 49-20720; Feb. 25, 1974, 49-22139

Int. Cl.² H01F 1/04

U.S. Cl. 148—31.57 **5 Claims**

1. A process for the preparation of a permanent magnet which comprises the steps of shaping the powder of an alloy expressed by the formula $Sm_{1-u}Ce_u(Co_{1-v-w-x}Cu_vFe_wMn_x)_z$ where $0 \leq u \leq 0.20$, $0.08 \leq v \leq 0.20$, $0 \leq w \leq 0.08$, $0.01 \leq x \leq 0.15$, and $7.2 \leq z \leq 7.8$, into a block by compression molding in a magnetic field, subjecting said block to sintering at a temperature in the range of from 1,170° to 1,270°C, and cooling the thus sintered block at a cooling velocity between 1°C/second and 30°C/second to a temperature of about 800°C, with subsequent cooling to room temperature without any intermediate aging step.

3,982,972

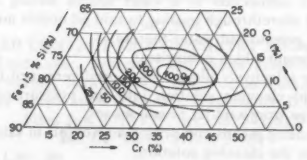
SEMIHARD MAGNETIC ALLOY AND A PROCESS FOR THE PRODUCTION THEREOF

Masao Iwata, Chichibu; Yoichi Ishijima, Konosu, and Osamu Fujita, Kumagaya, all of Japan, assignors to Hitachi Metals, Ltd., Japan

Filed Mar. 21, 1975, Ser. No. 560,941

Int. Cl.² C04B 35/00; H01F 1/00

U.S. Cl. 148—31.55 **13 Claims**



1. A heat-treated magnetic alloy having a residual magnetic flux density of 7,000 Gauss or more and a coersive force of 100 to 600 Oersted and consisting essentially of 17 to 45% by weight of chromium, 3 to 14% by weight of cobalt, 0.2 to 5% by weight of silicon and a balance of substantially iron.

3,982,973

CUBE TEXTURED NICKEL

Dale Thompson Peters, Mahwah; Gary Dale Sandrock, Ringwood, both of N.J., and Ernest Lee Huston, Suffern, N.Y., assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Dec. 11, 1975, Ser. No. 639,812
Int. Cl.² C22C *19/03*, *19/08*; C21D *9/46*
U.S. Cl. 148—32 10 Claims

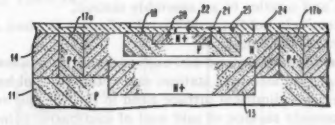
1. A process comprising providing a billet of metal having the fine-grain condition characterized by an average grain size up to 0.08 millimeter and having a composition consisting essentially of 0.0002% to about 0.003% sulfur, up to about 6% cobalt, up to 0.10% carbon, at least one ingredient from the group consisting of 0.1% to 0.5% iron, 0.1% to 0.5% manganese, 0.01% to 0.1% in total of the rare earth metals lanthanum and neodymium, 0.001% to 0.1% calcium and combinations thereof, with balance essentially nickel, provided that when the billet metal contains at least 0.0008% sulfur the billet metal also contain at least one of the rare earth metals and calcium ingredients, cold working the billet metal unidirectionally to reduce the thickness at least 95% and form the metal to strip having a thickness of up to about 0.25 millimeter, heating the cold worked strip in a nonoxidizing atmosphere in the temperature range of about 800°C to about 1260°C, provided that the heating be in the range of 900°C to 1100°C when the rare earth ingredient is present and the iron, manganese and calcium ingredients are absent, for a time sufficient to anneal and recrystallize the metal to the primary recrystallized cube texture condition and then cooling the recrystallized metal sufficiently to maintain the primary recrystallized cube texture condition and prevent secondary recrystallization.

3,982,974

COMPENSATION OF AUTODOPING IN THE MANUFACTURE OF INTEGRATED CIRCUITS

William A. Edel, Poughkeepsie, and Joseph Regh, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 201,024, Nov. 22, 1971, abandoned. This application Dec. 24, 1974, Ser. No. 536,050
Int. Cl.² H01L *21/205*, *21/22*
U.S. Cl. 148—175 21 Claims



1. In a method of making an integrated circuit including the steps of:

diffusing a principal impurity of a predetermined conductivity type into a region of a semiconductor substrate, and depositing an epitaxial layer on said substrate,

the improvement comprising the step of:

diffusing an autodoping compensating impurity of an opposite conductivity type solely into said substrate region prior to said epitaxial deposition step,

whereby the compensating impurity autodoping effect substantially compensates for and counteracts the principal impurity autodoping effect.

3,982,975

PROPELLANTS HAVING IMPROVED RESISTANCE TO OXIDATIVE HARDENING

Donald E. Elrick, Rawlings, and Harry Gilbert, Cumberland, both of Md., assignors to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 667,623, Sept. 6, 1967. This application June 4, 1968, Ser. No. 736,929
Int. Cl.² C06D *5/06*
U.S. Cl. 149—19.9 10 Claims

1. A solid propellant composition comprising a solid oxidizer and a polymeric binder formed by curing an uncured carboxy terminated rubber containing an average of about 2 free carboxyl groups per polymer molecule with, as curing agent, a mixture of difunctional epoxides and trifunctional epoxides wherein the diepoxide:triepoxide mole ratio in said mixture is 15:1 to 1:1 and the ratio of epoxy groups in said mixture to carboxy groups in said rubber being within the range of from 0.9:1 to 2:1, in the presence of a phenylenediamine antioxidant selected from the group consisting of N,N'-dialkylphenylenediamines containing at least 4 carbon atoms in each alkyl group and N,N'-diarylphenylenediamines, said phenylenediamine being chemically locked in the binder network during cure.

3,982,976

METHOD OF EVALUATING THE CLEANLINESS OF SILICON WAFERS

Edmund T. Marciniec, Chicago, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Dec. 9, 1974, Ser. No. 530,637
Int. Cl.² H01L *7/50*
U.S. Cl. 156—7 11 Claims

1. A method of texturing the surface of a silicon wafer with a pattern replicative of a pattern of undesirable contaminants thereon comprising the steps of:

a. placing the wafer in a mild vacuum; and then

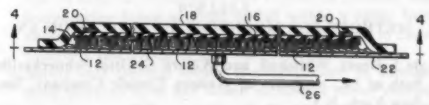
b. subjecting the wafer to a reactive, RF plasma which includes a mixture of a halocarbon gas and oxygen until a raised pattern replicative of the contaminant pattern is visible on the surface.

3,982,977

DUST COLLECTION MATS

David Edward Gordon, LaGrange, Ga., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 503,069, Sept. 4, 1974. This application Feb. 24, 1975, Ser. No. 552,713
Int. Cl.² A46D *1/00*; D05C *15/00*
U.S. Cl. 156—72 3 Claims



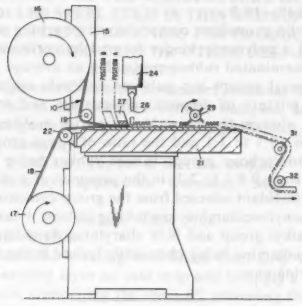
1. The method of producing individual dust control mats in a vacuum mold comprising the steps of: placing a tufted pile substrate having a latex tie-coat into the vacuum mold, placing an uncured calendered rubber sheet of greater length and width on said substrate, placing a narrow elongated reinforcing strip between the substrate and the uncured calendered rubber sheet in a direction substantially perpendicular to the grain of the rubber sheet, placing a negative pressure on the vacuum mold to seal the edges of the calendered rubber sheet to the mold, curing the calendered rubber sheet and laminating same to the substrate, releasing the negative pressure and trimming the edges of the cured rubber sheet to provide a dust control mat.

3,982,978

METHOD AND APPARATUS FOR MAKING PILE FABRIC

Charles W. Carpenter, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed June 24, 1975, Ser. No. 589,982
Int. Cl.[2] B32B 5/00
U.S. Cl. 156—72 8 Claims



1. A method of making pile fabric comprising:
advancing a continuous film of longitudinally striated and oriented thermoplastic material having longitudinal ribs interconnected by webs or reduced thickness;
advancing a continuous thermoplastic backing member;
forming upstanding transverse loops in said striated film having a portion thereof in contact with said backing member;
sonically fusion bonding said contacting portion of said striated film to said backing member; and
fibrillating said striated film after bonding to break the webs and separate the longitudinal ribs into individual filaments.

5. Apparatus for making pile fabric comprising:
means for advancing a continuous striated film having longitudinal ribs interconnected by webs of reduced thickness;
means for advancing a continuous thermoplastic backing member;
means for forming upstanding transverse loops in said film with the bottoms of said loops in contact with said backing member;
means for sonically fusion bonding said striated film to said backing member; and
means for fibrillating said bonded film to break said webs and separate said ribs into individual filaments.

3,982,979

METHODS FOR MOUNTING AN ARTICLE ON AN ADHERENT SITE ON A SUBSTRATE

Lyle J. Hentz, Whitehall, and Willard G. Otto, Schnecksville, both of Pa., assignors to Western Electric Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 374,436, June 28, 1973, abandoned. This application Nov. 9, 1973, Ser. No. 414,481
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976
Int. Cl.[2] B32B 7/14, 31/20; H01L 27/12; H05K 3/30
U.S. Cl. 156—73.6 9 Claims

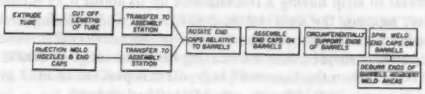
1. A method of mounting an article on a site, having an adherent coating, on a substrate, which comprises the steps of:
a. placing the article on a member associated with a locating and orienting cavity;
b. engaging the article intermittently with the walls of the cavity while lowering the member and the article into the cavity to locate and orient the article without the use of a liquid for supporting the article;
c. aligning the site on the substrate in relation to the cavity; and
d. raising the member with the article thereon to engage the article with the site and thereby mount the article on the site.

3,982,980

CARTRIDGE MAKING METHOD

Dick T. van Manen, Canandaigua, N.Y., assignor to Voplex Corporation, Pittsford, N.Y.

Continuation-in-part of Ser. No. 441,971, Feb. 13, 1974, abandoned. This application June 23, 1975, Ser. No. 589,698
Int. Cl.[2] B32B 31/20
U.S. Cl. 156—73.5 4 Claims


EXTRUDE TUBE
CUT OFF LENGTHS OF TUBE
TRANSFER TO ASSEMBLY STATION
ROTATE END CAPS RELATIVE TO BARRELS
ASSEMBLE END CAPS ON BARRELS
CIRCUMFERENTIALLY SUPPORT ENDS OF BARRELS
SPIN WELD END CAPS ON BARRELS
INJECTION MOLD NOZZLES & END CAPS
TRANSFER TO ASSEMBLY STATION
DEBURR ENDS OF BARRELS ADJACENT WELD AREAS

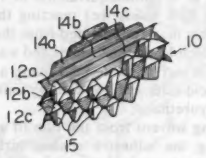
1. A method of making relatively rigid-walled dispenser cartridges, said method comprising:
a. extruding a generally cylindrical resin tube having a relatively rigid wall with constant inside and outside diameters;
b. cutting off equal lengths of said tube to provide cylinders for forming the barrels of said cartridges, said cylinders having ends evenly severed in planes approximately perpendicular to the longitudinal axes of said cylinders;
c. injection molding a quantity of single-piece resin end caps and nozzles each having a cylindrical surface interference fitting the inside surface of said barrel cylinders and each having a flange extending radially outward from said cylindrical surface by approximately the thickness of said wall of said barrel cylinders;
d. successively feeding said barrel cylinders and said end caps and nozzles to an assembly station;
e. successively holding said barrel cylinders in place at said assembly station;
successively holding said end caps and nozzles in a rotatable tool at said assembly station, said rotatable tool having a generally cylindrical surface sized to fit over and encircle the outside surface of said wall of said barrel cylinders;
g. rotating said rotatable tool and one of said end caps and nozzles relative to one of said barrel cylinders;
h. moving said rotating tool axially relative to said barrel cylinder to insert said cylindrical surface of said end cap and nozzle into an end region of said barrel cylinder by a sufficient amount to press said flange against said severed end of said barrel cylinder, said movement bringing said cylindrical surface of said tool over said outside surface of said wall of said barrel cylinder for supporting said wall of said barrel cylinder against radial expansion from said interference fit with said end cap and nozzle, and said movement cooperating with said tool rotation to spin weld said cylindrical surface and said flange of said end cap and nozzle respectively to said inside surface and said severed end of said barrel cylinder; and
i. using said cylindrical surface of said tool for preventing burring of said spin weld.

3,982,981

UNITARY HONEYCOMB STRUCTURE AND METHOD OF MAKING IT

Hiroshi Takao, Yokosuka; Kinmochi Togawa, Tokyo, and Kazuo Matoba, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokahama, Japan

Filed Dec. 6, 1973, Ser. No. 422,155
Claims priority, application Japan, Dec. 7, 1972, 47-122810
Int. Cl.[2] B31F 1/20; B32B 3/12; C04B 37/00; F28D 17/02
U.S. Cl. 156—89 9 Claims



1. A method of forming a unitary honeycomb structure composed of plurality of corrugated sheets fixedly superimposed one on another so that the axis of the corrugations of one sheet are oriented at a predetermined angle to the axes of the corrugations of each adjacent sheet, comprising the steps of:

preparing a plurality of flexible corrugated sheets formed of ceramic material and plurality of burnable support sheets of organic material;

superimposing alternately each of said flexible corrugated sheets and each of said burnable support sheets in succession so that the axes of the corrugations of one corrugated sheet are oriented at the predetermined angle to the axes of the corrugations of each adjacent corrugated sheet for thereby forming a flexible assembled structure; and

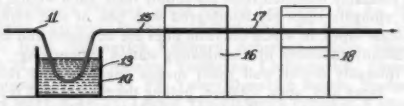
heating said flexible assembled structure at a temperature that will disintegrate said plurality of support sheets and sinter and fuse said plurality of corrugated sheets together to form a unitary honeycomb structure.

3,982,982

HOSE CONSTRUCTION

Anil H. Chudgar, Manitowoc, Wis., assignor to Imperial-Eastman Corporation, Chicago, Ill.

Division of Ser. No. 269,499, July 6, 1972, Pat. No. 3,866,631.
This application Oct. 7, 1974, Ser. No. 512,894
Int. Cl.[2] B31C 5/00; B29C 27/28
U.S. Cl. 156—143 12 Claims



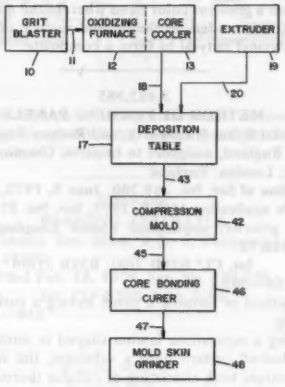
1. The method of reinforcing a hose core tube wherein reinforcing fibers are interlocked to the surface of the core tube by softening the surface of the core tube, said core tube being formed of a polycondensation product made by condensing at least one of the group of dicarboxylic acids and dicarboxylic acid ester having a molecular weight below 300 with a polyalkylene ether glycol having a molecular weight in the range of 400 to 6000 and at least one diol having a molecular weight below 250, hereinafter defined as polyester A, applying the reinforcing fibers, and setting the softened surface, said core tube surface being softened by passing the tube through a bath of polyester plasticizing means, said fibers being formed of a material unaffected by said plasticizing means, and subsequently removing the plasticizing means after the fibers are applied to effect a mechanical interlock of the fibers to said core tube.

3,982,983

CONTROLLED BONDING OF FLUOROELASTOMERS TO METAL SUBSTRATES

John C. Abraham, Metamora; Gary L. Grebner, East Peoria; William D. Brandon, Peoria, and John Jero, Washington, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 22, 1975, Ser. No. 570,322
Int. Cl.[2] B32B 31/00; C09J 5/00, 7/00
U.S. Cl. 156—154 13 Claims



1. A process for forming in a controlled manner a uniform fluoroelastomer layer directly bonded to a metal substrate, comprising:

forming a first roughened surface on one side of a metal substrate;

controllably oxidizing said substrate at a temperature sufficient to cause formation of an oxide layer on said first roughened surface and below the tempering temperature of the substrate, said oxidizing temperature being at least about 300°C;

adjusting the temperature of said substrate to a temperature above the curing temperature of the thermal setting fluoroelastomer, said fluoroelastomer comprising a copolymer of hexafluoropropylene and vinylidene fluoride, said temperature being adjusted to fall within a range from about 215° to about 175°C and being sufficient to cause relatively fast curing of said fluoroelastomer;

adhering said thermal setting fluoroelastomer in substantially uncured form and which includes a minor amount of calcium oxide homogeniously dispersed therethroughout and which is at a temperature sufficient to initiate slow curing thereof, directly onto said first surface without bonding said fluoroelastomer thereto, said fluoroelastomer being at a temperature prior to its adherence to said first surface which falls within a range from about 85° to about 115°C; and

compressing said fluoroelastomer between said first surface and a first mold face maintained at a temperature within about 10°C of the temperature to which said substrate is adjusted to cure said fluoroelastomer and concurrently bond it to said first surface, said compressing being carried out at a pressure which falls within a range from about 7×10^3kN per square meter to about 20×10^3kN per square meter.

3,982,984

PROCESS OF MAKING A POLYVINYL BUTYRAL COMPOSITE INTERLAYER FOR LAMINATED SAFETY GLASS

Donald B. Baldridge, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 355,364, April 27, 1973, Pat. No. 3,922,456. This application June 4, 1975, Ser. No. 583,713

Int. Cl.[2] B32B *27/06, 31/12, 31/30;* **C03C** *27/04*

U.S. Cl. 156—244 **1 Claim**

1. A process for preparing a composite polyvinyl butyral interlayer having a gradient color band for use in the preparation of laminated safety glass which process comprises extruding a layer of molten polyvinyl butyral onto the surface of a moving web of polyvinyl butyral which has been previously printed with a gradient color band wherein the molten polyvinyl butyral is extruded on the printed surface of the moving web of polyvinyl butyral to form a composite.

3,982,985

METHOD OF FORMING PANELS

James Ernest Ryan, Knebworth, and Rodney Smale, Hatfield, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 368,200, June 8, 1973, abandoned. This application May 5, 1975, Ser. No. 574,623

Claims priority, application United Kingdom, June 14, 1972, 27448/72

Int. Cl.[2] B29D *3/00;* **B32B** *31/00*

U.S. Cl. 156—303.1 **9 Claims**

1. A method of forming a panel having a surface pattern, comprising:

a. placing a superstrate lamina shaped in outline to define the desired pattern onto a substrate, the substrate and superstrate both consisting of cellular thermoplastic materials which are mutually discernible;

b. applying a die face against the surface of the superstrate lamina and against at least that portion of substrate adjacent the superstrate, said die face having a temperature above the softening temperature of both the superstrate and substrate thermoplastic materials;

c. pressing the die against the superstrate and the substrate with sufficient pressure to form a smooth glazed surface on the substrate where contacted by the die and to collapse the cellular structure of the superstrate and form a smooth glazed surface thereon thereby resulting in a panel having a single unitary non-cellular surface layer containing the pattern as an integral part thereof;

d. cooling the die face to harden said non-cellular surface layer; and

e. removing the die.

3,982,986

LAMINATES AND METHOD OF MAKING THEM

Edward Stone, Morris Plains; Joseph Zamer, Paramus, and Matthew Guagliardo, Bloomfield, all of N.J., assignors to Inmont Corporation, New York, N.Y.

Continuation of Ser. No. 466,292, May 2, 1974, abandoned, which is a division of Ser. No. 364,817, May 29, 1973, Pat. No. 3,887,757. This application May 1, 1975, Ser. No. 573,537

Int. Cl.[2] C09J *5/02*

U.S. Cl. 156—308 **7 Claims**

1. A method of laminating a saran surface to another saran surface, a saran surface to a treated polyethylene surface, or a treated polyethylene surface to a treated polyethylene surface, said method comprising:

A. applying a thin film of an adhesive composition to at least one of the surfaces to be laminated, said adhesive composition comprising an aqueous solution of a water soluble salt of a substantially linear thermoplastic polyurethane containing 0.5 to 2.5% by weight of nitrogen derived from tertiary amine groups and from 2 to 8% of nitrogen derived from isocyanate groups, said polyurethane being prepared by (a) reacting an excess of an isocyanate with a mixture of diols consisting of polyether diols having a molecular weight of from 425 to 4,000 and tertiary amine diols selected from the group consisting of N-phenyl dialkanol amine and N-lower alkyl dialkanol amines to obtain a reaction product having free isocyanate groups greater than 0.1 milliequivalents of NCO per gram of solution at 50% solids; (b) chain extending the reaction product with a chain extender selected from the group consisting of alkanol amines and alkylene diamines to obtain a chain extended polyurethane polymer containing from 0.07 to 0.1 milliequivalents of NCO per gram of solution at 50% solids; (c) reacting the free isocyanate groups with a material selected from the group consisting of water miscible alcohols, acids and water, and adding an amount of water miscible acid being added sufficient to form the acid salts with the tertiary amine groups present on the polyurethane;

B. evaporating solvent from the film of adhesive and

C. laminating the adhesive coated surface to the other surface to be laminated to obtain a bond strength of at least 350 grams.

3,982,987

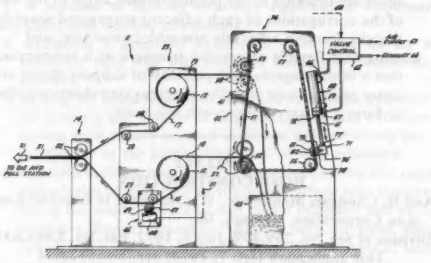
METHOD AND APPARATUS FOR DEREELING INTERLEAVED TAPES

Riley Kuehn, Jr., Auburn, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 19, 1975, Ser. No. 578,878

Int. Cl.[2] B32B *31/00*

U.S. Cl. 156—361 **15 Claims**



1. An apparatus for dereeling release tapes from a plurality of rotatably mounted resin ply supply reels, each wound with an elongate resin ply interleaved with one of said elongate release tapes, in which the resin plies are unwound and longitudinally advanced to a laminating station, comprising:

rotatably driven pull roller means engaging said release tapes and, upon rotation, pulling them from said reels;

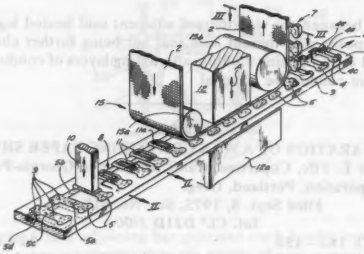
resolver means coupled to one of said resin plies and including signal output means issuing successive trigger signals, each in response to a predetermined longitudinal advancement of such resin ply; and

drive means connected to and for rotatably driving said pull roller means and including incrementing means connected to said resolver means for rotatably driving said roller means by a predetermined amount of rotation selected to pull said release tapes by a distance equal to said predetermined longitudinal advancement of said resin ply in response to each of said successive trigger signals issued by said output means of said resolver means, whereby said release tapes may be stripped off of each of said reels in successive increments which equal, on the average, the longitudinal rate at which said resin plies are withdrawn from said reels toward said laminating station.

3,982,988
APPARATUS FOR MAKING SLIDE-FASTENER STRINGERS

Helmut Heimberger, Grenzach, Germany, assignor to Opti-Holding AG, Glarus, Switzerland

Filed Jan. 25, 1974, Ser. No. 436,629
Claims priority, application Germany, Jan. 26, 1973, 2303796
Int. Cl.² B29D 5/00
U.S. Cl. 156—380 **6 Claims**



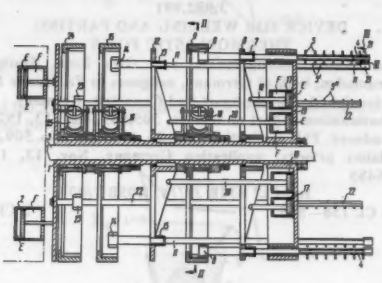
1. An apparatus for making a slide-fastener stringer half comprising an endless mold carrier provided with successive cavities for molding a succession of thermoplastic synthetic resin coupling members together forming a coupling element, the cavities being open to one side and defining for each such member a coupling head, a fastening portion for mounting the member on a tape, and a connecting portion for linking each member with an adjacent member; means for embossing the synthetic resin in each cavity at said fastening portion for displacing the synthetic resin to form an array of welding humps at said fastening portion while forcing the synthetic resin into contact with all of the surfaces defining the respective cavity; and means for welding said coupling element to a support tape under heat and pressure at said welding humps, said embossing means including an embossing wheel having a plurality of projections successively insertable into said cavities from said open side, said welding means including an ultrasonic tool juxtaposed with said wheel, said wheel forming an anvil for said ultrasonic tool.

3,982,989
APPARATUS FOR FEEDING AND SETTING BEADS ONTO THE ASSEMBLY DRUM OF A MACHINE FOR ASSEMBLING PNEUMATIC TIRES

Petr Fedorovich Badenkov, prospekt Mira, 112, kv. 234; Gennady Lazarevich Portny, 2 Kabelnaya, 10, kv. 64; Igor Mikhailovich Muslaev, ulitsa Junykh Lenintsev, 66, kv. 38; Regina Lazarevna Pukhova, 15 Parkovaya, 53, korpus 2, kv. 72; Isaak Shlemovich Roitburd, Scherbakovskaya ulitsa, 20/24, kv. 85; Natalya Vasilievna Ljubartovich, Shosse Entuziastov, 156, kv. 99; Valery Donovich Rossin, Studgorod MIFI, 8, kv. 21; Leonid Venediktovich Petrokas, 9 ulitsa Sokolinoi gory, 3, kv. 248, and Nikolai Sergeevich Tsaplin, 2 Schipovsky pereulok, 8, kv. 55, all of Moscow, U.S.S.R.

Filed Oct. 25, 1974, Ser. No. 518,145
Int. Cl.² B29H 17/12
U.S. Cl. 156—403 **9 Claims**

1. An apparatus for feeding and setting beads onto an assembly drum of a machine for assembling pneumatic tires, comprising: at least one first group of rods which extend substantially parallel to one another and are arranged in a single circle for supporting thereon a supply of the beads; at least one first group of vanes mounted on said first group of rods, uniformly spaced longitudinally of said rods, for separating said beads from one another; at least one first drive to effect the rotation of each individual rod about its own longitudinal axis, between a first position whereat said first vanes are projected beyond said circle to separate the beads from one another, and a second position whereat said first vanes are retracted into said circle, providing for forwarding of the beads longitudinally of said first group of rods; and a bead

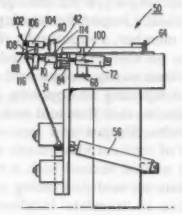


separating mechanism effecting incremental advancement of the bead rings along said first group of rods from the latter to the assembly drum.

3,982,990
FORMING APPARATUS

Ronald C. Goebel, Box 205A, R.D. 1, Pheasant Lane, Glen Mills, Pa. 19342

Filed Feb. 18, 1975, Ser. No. 550,230
Int. Cl.² B30B 7/04, 9/38
U.S. Cl. 156—443 **11 Claims**



1. An apparatus for forming countertops and the like from a laminated blank having a thermoplastic sheet adhered to a support base, said apparatus including:

A. a work-supporting bed for supporting the laminated blank with a side section of said blank extending outwardly beyond a front side margin of said bed;

B. a bend bar movably mounted with respect to the work-supporting bed to force the side section of the laminated blank over the front side margin of said bed to form said side section into a back splash; and

C. a cove stick inserting assembly connected to, and movable with said bend bar, said assembly including support means for supporting a cove stick adjacent a cove formed at the bend junction of the laminated blank after the bend bar has been moved to form the back splash, force transmitting means overlying a rear and upper surface of the cove stick when said cove stick is positioned on the support means of said assembly, a first set of fluid-actuated cylinders for moving said force transmitting means to apply a forward force to the rear surface of the cove stick, a second set of fluid-actuated cylinders for moving said force transmitting means to apply a downward force to the upper surface of the cove stick and valve means for actuating said first and second sets of cylinders to apply both a forward force and a downward force to the cove stick for inserting the cove stick into the cove and pressing surfaces of said cove stick into engagement with

cove-defining surfaces of the support base disposed on opposite sides of the bend junction.

3,982,991
DEVICE FOR WELDING AND PARTING THERMOPLASTIC FOILS

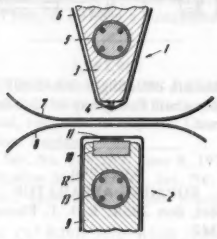
Klaus Hamm, Stuttgart-Ost, and Otto Beck, Stuttgart-Heumaden, both of Germany, assignors to Fr. Hesser Maschinenfabrik AG, Stuttgart-Bad Cannstatt, Germany

Continuation-in-part of Ser. No. 305,949, Nov. 13, 1972, abandoned. This application Sept. 26, 1974, Ser. No. 509,426

Claims priority, application Germany, Nov. 13, 1971, 2156485

Int. Cl.² B32B *31/18*; H05B *1/00*

U.S. Cl. 156—515 **5 Claims**



1. A device for seam welding and parting layer of webs of thermoplastic foils, comprising:

a first tool comprising a jaw member provided with an end face, an electrically responsive heating element in contact with said jaw member, a structurally rigid web parting and welding edge on said end face, and a protective layer extending at least partly around said edge;

a second tool comprising an opposing jaw member placed in juxtaposition to said first tool and having an end face located opposite the jaw end face of said first tool, a pressure pad of resilient elastomeric material secured on the said face of said second tool, a rigid metal pressure equalizing plate on said pad facing said edge, said plate being effective to translate localized pressure derived from said web welding and parting edge into substantially uniform pressure distributed across the abutting surface of said pad;

and a protective layer extending over both the pad and the plate of said second tool;

each of said protective layers being composed of a material having properties preventing the adherence of said foils thereto;

whereby upon heat and pressure contact between said first and second tool said edge is effective to weld together a plurality of web layers to create a seam and simultaneously part or separate such layers from the web to establish a container.

3,982,992
PRODUCTION OF HEAT SEALS IN THERMOPLASTIC MATERIAL WITH PRESS HEAD HAVING A TEMPERATURE GRADIENT

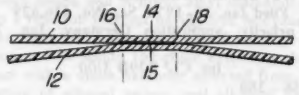
Myron L. Moffitt, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 330,350, Feb. 7, 1973, abandoned. This application Jan. 15, 1975, Ser. No. 541,296

Int. Cl.² B32B *7/06*, *7/10*, *31/20*; B65B *51/26*

U.S. Cl. 156—583 **1 Claim**

1. Heat sealing apparatus comprising a substantially heat sink substrate, two conductive legs extending from said substrate, heat insulation between said legs adjacent said substrate, heating means operatively associated with at least one of said legs and seal bar means joining said legs remote from said substrate, wherein said seal bar means is less heat conductive than said legs such that a temperature differential is established between the side thereof adjacent said heated leg and the opposite side thereof, said seal bar being further characterized as comprising multiple alternating layers of conductive and non-conductive material.



3,982,993
PREPARATION OF A WAX CONTAINING PAPER SHEET

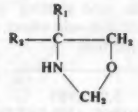
Rodger L. Fife, Cupertino, Calif., assignor to Georgia-Pacific Corporation, Portland, Oreg.

Filed Sept. 8, 1975, Ser. No. 610,937

Int. Cl.² D21D *3/00*

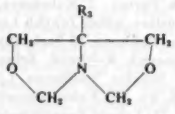
U.S. Cl. 162—158 **12 Claims**

1. In a process for the preparation of a paper sheet by dewatering a slurry of cellulosic fibers, the improvement which comprises treating the cellulosic fibers in the slurry with from 0.1 to 5 pounds per ton of the cellulosic fibers on a dry basis with a thermosetting, cationic polyamine or polyamide wet-strength resin, subsequently adding to the slurry of from 0.5 to 10 pounds per ton of dry cellulosic fiber in the slurry of a stabilizer comprising a mixture of an aqueous wax emulsion containing from 25 to 60 weight percent wax and, based upon the weight of the wax, of from 10 to 60 weight percent of a water-soluble, thermosetting urea-formaldehyde resin and from 20 to 90 weight percent of an aldehyde donor selected from the group consisting essentially of tris (hydroxymethyl) nitromethane, mono- and bicyclic oxazolidines and mixtures thereof, said mono- and bicyclic oxazolidines having formulas of:



(1)

where R_1 and R_2 represent alkyl radicals of from 1 to 2 carbon atoms, and



(2)

where R_3 represents an alkyl or hydroxyalkyl radical of from 1 to 2 carbon atoms,

dewatering the paper sheet, and drying the paper sheet.

3,982,994
GRID LATTICE WITH HORIZONTALLY-MOVABLE BAR

Felix Stanley Jabsen, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.

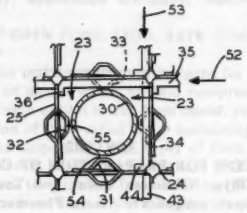
Filed Feb. 24, 1975, Ser. No. 552,014

Int. Cl.² G21C *3/34*

U.S. Cl. 176—78 **2 Claims**

1. A cellular fuel element grid structure comprising, a first plurality of generally parallel apertured fuel elememt grid plates having protruding bosses formed thereon, a further plurality of apertured fuel element grid plates having protrud-

ing bosses formed thereon, said further plurality of plates interlocking with and being generally perpendicular to said first plate plurality to form common corners at said respective apertures in order to establish rows of aligned slits, a plurality of bars lodged within said slits, stubs formed on said bars, said



stubs and said adjoining bar portions each having combined lengths that are greater than the widths of said respective slits to enable said stubs selectively to bridge across said slits and engage an adjoining portion of said grid plates and thereby to temporarily deflect said plates.

3,982,995

METHOD OF CONVERTING OIL SHALE INTO A FUEL

Teh Fu Yen, Altadena; Milo Don Appleman, Los Angeles, and John Eugene Findley, San Gabriel, all of Calif., assignors to The University of Southern California, Los Angeles, Calif.

Filed May 7, 1975, Ser. No. 575,448
Int. Cl.² C12B *1/00*
U.S. Cl. 195—3 H **29 Claims**

1. A method for the manufacture of bioleached oil shale from oil shale containing kerogen and bitumen bound by an inorganic matrix having a substantial acid soluble portion, the steps comprising:

a. providing an aqueous bioleaching medium comprised of a bacteria or mixture of bacteria compatible with oil shale and capable of producing an acid that will neutralize and dissolve a substantial portion of the inorganic matrix of said oil shale, and providing a nutrient to promote the growth of said bacteria;

b. incubating said bioleaching medium to promote the growth of said bacteria and thereby produce a continuous supply of acid; and

c. contacting the oil shale with said incubated medium to dissolve only the acid soluble portion of the inorganic matrix and to convert said matrix into a porous sponge-like structure which exposes the kerogen and bitumen therein for combustion or for conversion into other fuels.

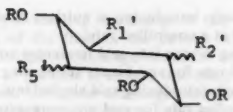
3,982,996

PROCESS FOR PREPARING AMINOCYCLITOL ANTIBIOTICS

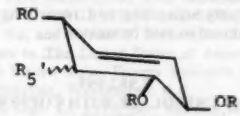
Sol J. Daum, Albany, and Robert L. Clarke, Bethlehem, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Sept. 22, 1975, Ser. No. 615,593
Int. Cl.² C12D *9/20*
U.S. Cl. 195—29 **12 Claims**

1. The process for preparing aminocyclitol antibiotics of the streptamine, deoxystreptamine or dideoxystreptamine-type which comprises culturing a nutrient medium containing carbohydrates, a source of assimilable nitrogen, essential salts and a cyclitol of the 2-R_2'-5-R_5'-3,4,6-trihydroxycyclohexanone or 2-R_2'-5-R_5'-1,3,4,6-tetrahydroxycyclohexane class represented by the formula:



or of the 5-R_5'-3,4,6-trihydroxycyclohexene class represented by the formula:



where, in either case, R is hydrogen or acetyl; R_1' is oxo or hydroxy; and R_2' and R_5' each are hydrogen, hydroxy or OR, in the presence of microorganism mutants which are only capable of biosynthesizing antibiotics of the streptamine, deoxystreptamine or dideoxystreptamine type in the presence of the said cyclitols, and recovering said aminocyclitol antibiotics from the culture broth.

3,982,997

IMMOBILIZED GLUCOSE ISOMERASE

David L. Eaton, and Ralph A. Messing, both of Horseheads, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Sept. 18, 1974, Ser. No. 507,209
Int. Cl.² C07G *7/02*; C12D *13/00*
U.S. Cl. 195—31 F **13 Claims**

1. An immobilized enzyme composite comprising glucose isomerase adsorbed to the internal surfaces of a high surface area porous inorganic support material having an average pore diameter between about 100 A and 1000 A and consisting of between 0.84 and 12.0% MgO and 99.16% and 88.0% Al_2O_3 by weight.

3,982,998

METHANOL FOAM FERMENTATION TO SINGLE CELL PROTEIN BY MICROORGANISMS

Donald O. Hitzman, and Eugene H. Wegner, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 6, 1974, Ser. No. 530,422
Int. Cl.² C12C *11/14*, *11/10*; C12B *1/08*
U.S. Cl. 195—49 **16 Claims**

1. A process for the production of microbial cells, said process including the steps of:

a. placing a microorganism into a fermenter containing a nutrient medium and aerobically culturing said microorganism, said microorganism being capable of assimilating alcohol as a main source of carbon;

b. introducing an alcohol having from 1–16 carbon atoms into said fermenter as the main carbon source for said microorganism to assimilate and produce microbial cells;

c. maintaining said alcohol and medium in a foamed condition in said fermenter so that said fermenter is essentially foam-filled; and

d. separating and recovering the microbial cells produced in said fermenter.

12. A process for the production of microbial cells, said process including the steps of:

a. placing a microorganism in a fermenter, said microorganism being capable of assimilating a straight chain alcohol having 1 to 16 carbon atoms per molecule as a main source of carbon;

b. continuously introducing a nutrient medium into said fermenter at a controlled rate;
c. introducing oxygen into said fermenter continuously at a controlled rate for aerobically fermenting said alcohol;
d. continuously introducing said alcohol into said fermenter at a controlled rate for said microorganism to assimilate as the carbon source and produce microbial cells;
e. maintaining said fermenter during operation at a pressure of at least approximately 1 atmosphere;
f. maintaining said alcohol and medium in a foamed condition in said fermenter so that said fermenter is essentially foam-filled; and
g. continuously separating and recovering the microbial cells produced in said fermenter.

3,982,999

COMPLEXING CRESOLASE WITH COPPER CHELATING AGENTS

Jerome A. Kharasch, 6300 W. Touhy Ave., Niles, Ill. 60648

Filed July 26, 1974, Ser. No. 492,198
Int. Cl.² C07G 7/02
U.S. Cl. 195—63 **8 Claims**

1. A complex of cresolase and a copper chelating agent selected from the compounds consisting of 8-hydroxyquinoline, 8-mercaptoquinoline, 7-chloro-8-hydroxyquinoline, 2-methyl-oxine, 4-azo-oxine, 4-hydroxyacridine, 6-hydroxy-m-phenantholine, 3,6-benzo-oxine, 8-methoxyquinoline, 8-hydroxyquinoline-5-sulfonic acid and α,α dipyridyl.

3,983,000

BONDING PROTEINS TO INORGANIC SUPPORTS

Ralph A. Messing, and Gerald Odstrchel, both of Horseheads, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Apr. 1, 1976, Ser. No. 672,633
Int. Cl.² C07G 7/02
U.S. Cl. 195—63 **12 Claims**

1. A method of bonding a biologically active protein to an inorganic support material to prepare an immobilized protein-support composite, the method comprising the steps of
a. reacting a high surface area, water insoluble inorganic material having available surface oxide or hydroxyl groups with a solution of o-dianisidine to form residues of o-dianisidine on the surface; and
b. reacting the reaction product of step (a) with an aqueous solution of the protein.

3,983,001

ISOLATION OF BIOLOGICALLY ACTIVE COMPOUNDS BY AFFINITY CHROMATOGRAPHY

Jiri Cöupek, Prague; Jaroslava Truková, Cesky Brod; Olga Hubálková, Prague; Miroslava Kriváková, Prague, and Viktor Mansfeld, Prague, all of Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Continuation-in-part of Ser. No. 357,814, May 7, 1973, abandoned. This application Feb. 12, 1976, Ser. No. 657,601
Claims priority, application Czechoslovakia, May 10, 1972, 3136-72
Int. Cl.² C07G 7/02
U.S. Cl. 195—66 R **23 Claims**

1. A method for the isolation of biologically active compounds by affinity chromatography comprising forming a sorption complex between a solvent soluble biologically active compound to be isolated and a biologically active compound linked to a hydrogel carrier by a covalent bond, said hydrogel carrier being a hydrophilic macroporous copolymer formed by copolymerizing at least one hydrophilic monomer selected from the group consisting of:
A. hydroxyl alkyl acrylates or methacrylates; poly glycol acrylates or methacrylates; amino alkyl acrylates or methacrylates; acrylonitrile or methacrylonitrile;
acrylic or methacrylic acid of methylolacrylamide copolymerized with another member of said group, or a member selected from the group of cross-linking agents consisting of:
B. glycol polyacrylates or methacrylates;
alkylene di acrylates or methyacrylates;
alkylene bis acrylamide or methacrylamides;
di vinyl benzene; or a member selected from the group consisting of:
C. acrylic and methacrylic acid derivatives, or combinations thereof.

3,983,002

PROCESS FOR PREPARATION OF CELLULASE

Takaichi Ohya; Nobumasa Yokoi, and Tamio Mase, all of Aichi, Japan, assignors to Amano Pharmaceutical Co., Ltd., Nagoya, Japan

Filed Nov. 8, 1974, Ser. No. 522,262
Claims priority, application Japan, Nov. 10, 1973, 48-125934
Int. Cl.² C12D 13/10; C07G 7/02
U.S. Cl. 195—66 R **6 Claims**

1. A process for preparing cellulase 212 comprising:
aerobically culturing Aeromonas sp. No. 212, FERM-P No. 2306, ATCC No. 31085, in a culture medium containing a nitrogen source, a carbon source and a nutrient while maintaining the pH of the culture medium at 6–10 until cellulase is produced and accumulated therein; and
separating and recovering the cellulase produced and accumulated in the culture medium during the culturing step.

3,983,003

MYCOBACTERIA CULTURE MEDIUM AND METHOD FOR IN VITRO CULTIVATION OF LEPROSY MYCOBACTERIA EMPLOYING SAME

Olaf K. Skinsnes, 438 Portlock Road, Honolulu, Hawaii 96825, and Eiichi Matsuo, 3112 Brokaw St., Honolulu, Hawaii 96815

Filed Jan. 20, 1976, Ser. No. 650,703
Int. Cl.² C12B 3/14, 1/00
U.S. Cl. 195—96 **20 Claims**

1. A culture medium for the in vitro cultivation of mycobacteria comprising a hyaluronic acid-enriched culture medium whose base is selected from the group consisting of (a) a physiological mixture comprising fresh yeast extract in an amount of at least about 10% by weight in a phosphate buffer of pH 5.5 to 7 and (b) Dubos oleic acid-albumin liquid medium, the amount of hyaluronic acid present in said culture medium being at least about 0.1% by weight.

10. A method for the in vitro cultivation of a mycobacterium selected from the group consisting of *Mycobacterium leprae* and *Mycobacterium lepraemurium*, comprising the steps of inoculating a viable specimen of said mycobacterium into a hyaluronic acid-enriched culture medium whose base is selected from the group consisting of (a) a physiological mixture comprising fresh yeast extract in an amount of at least about 10% by weight in a phosphate buffer of pH 5.5 to 7 and (b) Dubos oleic acid-albumin liquid medium, the amount of hyaluronic acid present in said culture medium being sufficient to promote growth of said mycobacterium; and maintaining said mycobacterium-inoculated culture medium at a temperature within the range of from about 25° to about 37.5°C for a period of time sufficient to grow a culture of said mycobacterium.

3,983,004

PREPARATION OF A DIAGNOSTIC AGENT FOR MEASURING THE COAGULABILITY OF BLOOD

Heiner Trobisch, Marburg an der Lahn, and Horst Schwinn, Marbach-Michelbach, both of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Germany

Filed Nov. 11, 1974, Ser. No. 522,759

Claims priority, application Germany, Nov. 13, 1973, 2356493

Int. Cl.[2] G01N *31/00*, *33/16*; A61K *35/48*

U.S. Cl. 195—99 15 Claims

1. A method for making a diagnostic agent for measuring the coagulability of blood, which method comprises washing a thrombogenic tissue until it is free from blood, preparing an aqueous suspension of the washed tissue containing sufficient lye to provide the suspension with a pH of from 10 to 12, extracting the tissue in the suspension at said pH for 15 minutes to 48 hours at a temperature from 30°C. to 1°C., whereby the shortest extraction time is correlated with the highest temperature, the longest extraction time with the lowest temperature, and values between these are correlated analogously, acidifying the aqueous suspension to impart a slightly acid pH, separating the extract from the tissue, and adding a water-soluble calcium salt to the extract.

3,983,005

INTEGRAL ELEMENT FOR THE ANALYSIS OF CHOLESTEROL

Charles T. Goodhue; Hugh A. Risley; Roy E. Snoke, and Gary M. Underwood, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 454,621, March 25, 1974, abandoned. This application Apr. 7, 1975, Ser. No. 565,897

Int. Cl.[2] C12K *1/04*

U.S. Cl. 195—103.5 R 67 Claims

1. An integral element for analysis of total cholesterol in a liquid, the element I comprising a spreading layer in fluid contact with a reagent layer and II containing

a. a cholesterol ester hydrolyzing composition comprising lipase having cholesterol esterase activity and protease; and

b. cholesterol oxidase;

the cholesterol ester hydrolyzing composition and cholesterol oxidase being disposed within the element such that, in liquid applied to the element, cholesterol esters are saponified and cholesterol is depomposed producing a detectable change related to the total cholesterol content of the liquid.

3,983,006

METHOD FOR DETERMINING MINIMUM INHIBITORY CONCENTRATION OF ANTIBIOTIC

Jesse L. Acker, Rockaway, N.J., and Peter M. Meserol, E. Northport, N.Y., assignors to Akro-Medic Engineering, Inc., Denville, N.J.

Division of Ser. No. 290,654, Sept. 20, 1972, Pat. No. 3,837,745. This application Aug. 23, 1974, Ser. No. 500,125

Int. Cl.[2] C12K *1/04*

U.S. Cl. 195—103.5 R 8 Claims

1. A method of evaluating a biological fluid which comprises:

a. placing the biological fluid into a chamber,

b. placing an array of biological challenge materials into at least a portion of a plurality of cuvettes disposed below said chamber,

c. monitoring the change in optical properties of said fluid in said chamber until the desired conditions of optical properties has been achieved,

d. passing a finite portion of said fluid from said chamber into at least a portion of said cuvettes, at least one of which contains no biological challenge material, thereby producing an array of substantially identical fluid samples of known concentrations, and

e. continually evaluating the change in rate of the optical properties of the fluid in the cuvette which does not contain biological challenge material and the optical properties of the fluid in at least one other cuvette which contains said biological challenge material, and thereby quantitatively determining the inhibitory concentration of said biological challenge material.

3,983,007

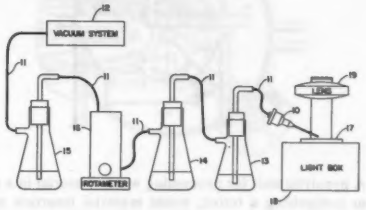
SYSTEM FOR SAMPLING AND MONITORING MICROSCOPIC ORGANISMS AND SUBSTANCES

Frederick H. F. Au, and Werner F. Beckert, both of Las Vegas, Nev., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 23, 1975, Ser. No. 615,962

Int. Cl.[2] C12K *1/00*

U.S. Cl. 195—103.7 4 Claims



1. A method for determining the uptake of contaminants from soils by selected soil microorganisms comprising the steps of: mixing the soil sample to be tested which has been moistened to 10–80% of its moisture holding capacity with a measured quantity of uncontaminated spores of a mold featuring aerial spores, maintaining this mixture of soil and mold spores at specified temperature conditions for a specified time period, applying an agar layer to the top of the thus treated soil sample, allowing a time period for the mold growing in the sample to form aerial spores, collecting the thus formed aerial spores, and drying and analyzing the spores for the contaminants.

3,983,008

METHOD OF EXTRACTING USEFUL COMPONENTS FROM MICROBIAL CELLS

Tatsuo Shinozaki; Nobuyuki Kikkawa; Fumiaki Fujitani, and Kenjiro Tanaka, all of Sodegaura, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Filed May 20, 1975, Ser. No. 579,228

Claims priority, application Japan, May 27, 1974, 49-58860

Int. Cl.[2] C12B *1/00*

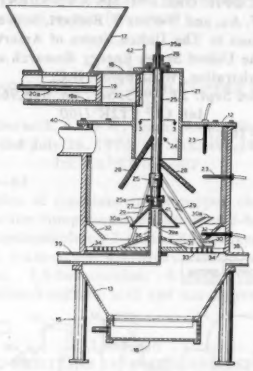
U.S. Cl. 195—104 9 Claims

1. A method of extracting a component from microbial cells containing the same, which comprises disrupting microbial cells in a first stage in a high-pressure multi-stage homogenizer in the absence of a solvent for extracting said component from the cells, and contacting said disrupted cells with a solvent in a directly succeeding stage of said homogenizer to extract said component from the cells.

3,983,009
METHOD AND APPARATUS FOR DESTRUCTIVE DISTILLATION OF SOLID WASTES AND RECOVERY OF DISTILLED PRODUCTS

David A. Neal, 11424 Freeway Pl., NE., Albuquerque, N. Mex. 87123, and Patrick L. Stone, 501 N. Mississippi, Ada, Okla. 74820

Filed Mar. 25, 1974, Ser. No. 454,138
Int. Cl.[2] C10B 9/00
U.S. Cl. 202—93 5 Claims

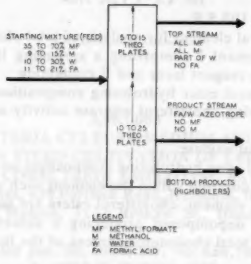


1. A pyrolytic unit for processing waste material in a closed system comprising a retort, waste material insertion means, and char collecting means, said retort being a cylindrical chamber supported with its axis vertical, said cylindrical chamber having (a) an elongated cylindrical wall, a top transverse closure plate, a bottom transverse grate plate, an elongated vertical waste inlet duct closed at the upper end by a closure plate hermetically affixed to and centrally located in such top transverse closure plate with its direction of elongation perpendicular to the plane of the transverse closure plate, a rotatable stirring assembly rotatably supported along the vertical axis of the retort, a horizontal waste inlet duct connected to and communicating with a side wall of the elongated vertical waste inlet duct outside the retort, one-way valve means in said horizontal waste inlet duct to isolate the interior of the retort from the atmosphere, means for forcing waste material through the waste inlet duct valve into the retort, said grate plate being supported within said retort cylindrical wall proximate the lower end thereof, a fresh air inlet duct diametrically supported in the cylindrical wall adjacent the lower surface of the grate plate, a vertical fresh air duct located along the vertical axis of the retort and having a closed upper end located in the central part proximate the retort combustion zone, said vertical fresh air duct having its lower end connected to and supported on the inner end of the fresh air inlet duct, a stirring assembly journal centrally located and passing through the (top wall) waste inlet duct closure plate, said stirring assembly comprising an elongated vertical rotatable shaft, rotatably supported by (the) lower and upper journals, said vertical rotatable shaft having an elongated extension passing upwardly through the upper journal for connection to rotating means, elongated waste stirring members affixed to the rotatable shaft with vertical spacing therebetween and declined downwardly from said shaft into the waste preheating zone, combustible material and char stirring arms affixed to the rotatable shaft at a common level thereon, said combustible waste and char stirring arms comprising outwardly and downwardly inclined arms and a foot member affixed to the lower end of each of said arms parallel to and closely proximate the upper surface of the grate plate, a downwardly inclined annular conical shield affixed to the cylindrical wall of the retort at the bottom of the combustion zone, at least one enlarged char exit port supported at the outer periphery of the grate plate under the annular conical shield, said enlarged char exit port being thus vertically shielded from contract with burning waste, said stirring foot members extending under the conical shield and adapted to pass over the said at least one enlarged char exit port, a recycled gas inlet duct supported in the cylindrical wall and porting within said retort below and adjacent the bottom surface of the grate plate, closed char collecting means connected to the bottom of the retort cylindrical wall, and unidirectional gate means in the char collecting means for intermittant removal of solid combustion residue without communicating the interior of the retort to the atmosphere.

3,983,010
RECOVERY OF THE FORMIC ACID/WATER AZEOTROPE BY DISTILLATION

Konrad Rauch, Limburgerhof; Hans Kiefer, Wachenheim; Dieter Hesse, Frankenthal; Max Strohmeyer, Limburgerhof, and Heinz Hohenschutz, Mannheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Feb. 6, 1975, Ser. No. 547,642
Claims priority, application Germany, Feb. 15, 1974, 2407157
Int. Cl.[2] C07C 51/44
U.S. Cl. 203—15 3 Claims



1. A process for the recovery of aqeuous solutions of about 75 weight percent formic acid and about 25 weight percent water from a starting mixture containing 35 to 70 weight percent of methyl formate, 9 to 15 weight percent of methanol, 10 to 30 weight percent of water and 11 to 21 weight percent of formic acid by fractional distillation in a column maintained at a temperature range of from 80° to 90°C at the top of the column to 105° to 115°C at the bottom, which comprises feeding said starting mixture into the upper half of the column, maintaining a zone of 5 to 15 theoretical plates, in which the formic acid concentration decreases relative to its concentration in said starting mixture, above the feed point of the starting mixture, withdrawing a mixture of water, methanol and methyl formate at the top of the column, maintaining below said feed point a zone of 10 to 25 theoretical plates, in which the formic acid concentration increases relative to its concentration in said starting mixture until the formic acid/water mixture reaches the composition of its azeotrope, which consists of about 75 weight percent formic acid and about 25 weight percent water, and withdrawing the formic acid/water azeotrope from the bottom portion of the column.

3,983,011

REMOVAL OF CHLORIDE IMPURITIES FROM AN ADIPONITRILE FEED BY DISTILLATION IN THE PRESENCE OF A HIGH BOILING AMINE

John Bentley Wiggill, Hagerstown, Md., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed July 11, 1974, Ser. No. 487,813
Int. Cl.[2] B01D 3/34
U.S. Cl. 203—59 5 Claims

1. In a process of purifying crude adiponitrile containing chloride impurities by distillation, the improvement comprising reducing the chloride impurities by mixing the crude adiponitrile with 100–10,000 ppm of at least one amine having an atmospheric boiling point greater than 295°C. based on the crude adiponitrile feed stream to thereby form a mixture, then distilling the crude adiponitrile mixture at a temperature of about 60° to 295°C and a pressure about 0.1 mm HG to atmospheric, and recovering adiponitrile from the resultant distillate with lower amounts of chloride impurities relative to said crude adiponitrile.

3,983,012

EPITAXIAL GROWTH OF SILICON OR GERMANIUM BY ELECTRODEPOSITION FROM MOLTEN SALTS

Uri Cohen, Stanford, Calif., assignor to The Board of Trustees of Leland Stanford Junior University, Stanford, Calif.

Filed Oct. 8, 1975, Ser. No. 620,554
Int. Cl.[2] C25B 1/00; C25D 3/66, 5/02; C25C 3/00
U.S. Cl. 204—15 14 Claims

1. A method for electrodepositing an epitaxial crystal layer of a group IV*b* element plating ion selected from the group consisting of silicon and germanium onto a lattice matching substrate selected from said group IV*b* elements at least as noble as said plating ion, said substrate comprising the cathode of an electrolytic cell, said method comprising:

a. forming an electrolytic salt bath for said electrolytic cell including a salt source of said plating ion and a solvent comprising at least one alkali metal fluoride, said salt source of plating ion comprising at least 0.1 mole percent of said bath composition,

b. removing essentially all oxides from the electrolytic bath by the following steps:

1. applying a vacuum to the bath,

2. supplying in the bath a source of reagent chemically reactive with oxide ions in sufficient quantity to react with any oxide ion in the bath,

3. reacting said oxygen reactive reagent with oxygen in the bath at a molten bath temperature, and

4. removing the reaction product from the bath, and

c. passing a current between an anode in the bath and said cathode at a sufficient current density to electrodeposit silicon as an epitaxial crystal layer onto said cathode, said bath being maintained under an inert gas atmosphere at a temperature sufficient for said bath to be in a totally molten state.

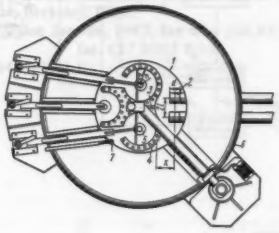
10. The method of claim 1 in which an electrically insulative layer including at least one open window is disposed on the surface of said cathode prior to contacting the same with said electrolytic bath, whereby said epitaxial crystal selectively grows only in the window.

3,983,013

METHOD OF ELECTROLYTIC BORATING OF ARTICLES

Mark Borisovich Gutman, 4 Grazhdanskaya ulitsa, 43, korpus 2, kv. 5; Vsevolod Grigorievich Kaufman, Petroverigsky pereulok, 3, kv. 24; Mikhail Savelievich Gorodinsky, Snezhnaya ulitsa, 4, kv. 24; Jury Alexandrovich Shakhnes, Zarevsky proezd, 5, kv. 32; Larisa Sergeevna Mezhueva, Novoslobodskaya ulitsa, 52, kv. 11; Irina Stepanovna Altukhova, prospekt Vernadskogo, 33, kv. 188, all of Moscow, U.S.S.R.; Jury Grigorievich Kaloshin, deceased, late of Moscow, U.S.S.R., and by Albina Adolfovna Kaloshina, administratrix, Chertanovskaya ulitsa, 24, korpus 2, kv. 138, Moscow, U.S.S.R.

Continuation of Ser. No. 382,846, July 26, 1973, abandoned.
This application Sept. 23, 1974, Ser. No. 508,216
Int. Cl.[2] C25D 9/08, 11/00, 3/66
U.S. Cl. 204—39 1 Claim



1. A method of electrolytic borating articles comprising the steps of: filling a crucible with a melt of a boron-bearing medium; immersing electrodes connected to a source of alternating current, a holder enclosing articles and connected to the negative terminal of a source of direct current, and anodes connected to the positive terminal of the source of direct current in the melt; energizing the electrodes to heat the melt; energizing the anodes and the holder to form a diffuse boron-plated layer on the surface of the articles; and maintaining the distances between the electrodes, the anodes and the articles so that the density of the direct current on the surface of the articles is greater than the density of the alternating current, as determined by the following formulas:

$$R_{a.c.} = \frac{\rho \cdot \ln\left[\frac{2l}{d} + \sqrt{2\left(\frac{l}{d}\right)^2 - 1}\right]}{2\,\frac{x}{d}}$$

$$H \cdot \operatorname{arc\,tg} \sqrt{2\left(\frac{l}{d}\right)^2 - 1}$$

$$R_{d.c.} = \frac{\rho}{2\pi h} \cdot \ln \frac{r_2}{r_1}$$

where

$R_{a.c.}$ = resistance in the circuit of A.C. electrodes, ohm;

$R_{d.c.}$ = resistance in the electrolytic circuit, ohm;

ρ = resistivity of the boron-bearing medium, ohm.cm;

H = effective length of A.C. electrodes, *m*;

d = diameter (side of a square) of A.C. electrodes, *m*;

l = spacing of A.C. electrodes, *m*;

h = length of articles, *m*;

X = current coordinate making allowance for the position of the articles in the working space of the crucible, *m*;

r_1 = radius of a D.C. anode, *m*; and

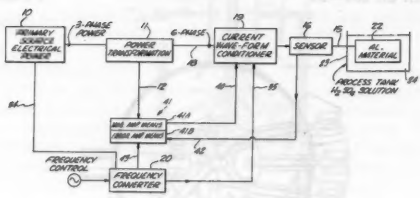
r_2 = inside radius of the cathode which is essentially the holder with the articles, m.

3,983,014

ANODIZING MEANS AND TECHNIQUES

Frederick S. Newman, Sepulveda; John T. Hartman, Reseda, and Francis A. Dedona, Sherman Oaks, all of Calif., assignors to The Scionics Corporation, Culver City, Calif.

Filed Dec. 16, 1974, Ser. No. 533,333
Int. Cl.[2] C25D *11/04, 11/08*
U.S. Cl. 204—58 **10 Claims**



1. In a multi-phase anodizing system in which it is desired to produce an oxide coating on aluminum or the like in an anodizing bath using energy derived from a multi-phase source, wherein the improvement comprises modifying a multiphase current derived from said source to supply positive and negative current pulses alternately through said bath with the ratio of average negative current to average positive current being greater than approximately three percent but less than twenty percent and with the frequency of such positive and negative pulses in each phase being one or more pulses per second and with the frequency of such positive and negative pulses in each phase being less than the frequency of said multi-phase source from which said multiphase current is derived.

3,983,015

ELECTROCHEMICAL FLUORINATION USING EXCESS CURRENT

William V. Childs, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 23, 1975, Ser. No. 589,632
Int. Cl.[2] C25B *3/08*
U.S. Cl. 204—59 F **8 Claims**

1. In a process for the electrochemical fluorination of a fluorinatable feedstock comprising:

passing an electric current through a current-conducting essentially anhydrous liquid hydrogen fluoride electrolyte contained in an electrolysis cell provided with a cathode and porous carbon anode;

contacting said feedstock with said electrolyte within pores of said anode to thus at least partially fluorinate at least a portion of said feedstock;

and recovering fluorinated product and unreacted feedstock from said anode;

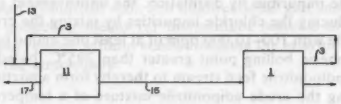
the improvement comprising introducing said feedstock at a rate within the range of 0.2 to 0.75 feedstock hydrogen equivalents per hour per 53.6 amperes of current.

3,983,016

METHOD OF PREPARING CHROMIUM

Arthur C. Ellsworth, Corpus Christi, and William W. Carlin, Portland, both of Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 490,152, July 19, 1974, abandoned. This application Oct. 1, 1975, Ser. No. 618,585
Int. Cl.[2] C25C *1/10*; C25B *1/14, 1/22*
U.S. Cl. 204—89 **20 Claims**



1. A process for the electrolytic production of chromium metal comprising the steps of:

a. electrolyzing an electrolyte comprising an alkali metal chromate, chromic acid, and from 0.4 to 1.5 weight percent sulfate ion, basis total chromic acid in the feed in a first electrolytic cell;

b. forming chromium metal at a cathode of said first electrolytic cell;

c. removing an effluent steam depleted in chromic acid content from said first electrolytic cell and introducing a portion of said effluent stream into an anolyte chamber of a second electrolytic cell;

d. introducing an aqueous liquid composition containing an alkali metal chromate and an alkali metal dichromate into the anolyte chamber of said second electrolytic cell; and

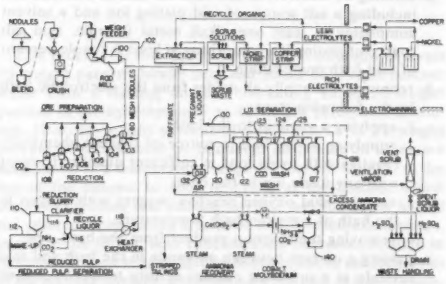
e. passing an electrolyzing current through said second electrolytic cell, removing an effluent comprising an alkali metal chromate and chromic acid from the anolyte chamber of said second electrolytic cell, and introducing the effluent from the anolyte chamber of the second electrolytic cell into the first electrolytic cell.

3,983,017

RECOVERY OF METAL VALUES FROM MANGANESE DEEP SEA NODULES USING AMMONIACAL CUPROUS LEACH SOLUTIONS

Lester J. Szabo, Charlottetown, Canada, assignor to Kennecott Copper Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 311,063, Dec. 1, 1972, abandoned. This application Feb. 10, 1975, Ser. No. 548,430
Int. Cl.[2] C25C *1/12, 1/06*; C01G *3/14, 53/12*
U.S. Cl. 204—106 **40 Claims**



22. A continuous process for treating manganese nodules to enable copper, nickel, cobalt and molybdenum values contained therein to be recovered therefrom comprising the steps of:

a. contacting a copper containing ammoniacal leach solution with a reducing gas in a vessel to reduce the copper and produce an ammoniacal leach solution containing cuprous ions;

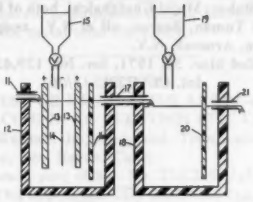
b. contacting the ammoniacal leach solution containing cuprous ions prepared in step (a) with ground manganese nodules to form a slurry and reduce the manganese oxides in the nodules;
c. separating the reduced nodules in the slurry from the leach solution to leave a pregnant leach solution containing copper, nickel, cobalt and molybdenum metal values;
d. washing the nodule residue with an ammoniacal-ammonium carbonate wash solution to remove entrained metal values from the nodule residue and yield a wash effluent containing copper, nickel, cobalt and molybdenum values; and
e. recovering metal values from the wash effluent.

3,983,018

PURIFICATION OF NICKEL ELECTROLYTE BY ELECTROLYTIC OXIDATION

Gyula John Borbely, Copper Cliff; Alexander Illis, Mississauga, and Bernardus Jacobus Brandt, Port Colborne, all of Canada, assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Sept. 10, 1975, Ser. No. 612,011
Claims priority, application Canada, Feb. 12, 1975, 219948
Int. Cl.[2] C25F 7/02; C25D 21/16
U.S. Cl. 204—130 14 Claims



1. A process for removing at least one impurity from a group consisting of cobalt, iron, arsenic and lead from an aqueous, essentially copper-free, nickel-containing electrolyte which comprises: immersing at least one anode and at least one cathode into said electrolyte, said electrolyte containing a chloride salt of an alkali metal; applying current between said anode and said cathode for a time period sufficient to generate in said electrolyte an equivalent chlorine content of at least about 0.05 gram per liter while maintaining the current density at said cathode at a level sufficient to prevent substantial deposition of metal at said cathode but sufficient to generate a metal hydroxide in the vicinity of said cathode; increasing the pH of said electrolyte whereby said equivalent chlorine produced reacts with at least one impurity present in said electrolyte to provide a precipitate containing said at least one impurity; and separating said precipitate from said electrolyte.

3,983,019

SEPARATION OF THE MERCURY ISOTOPES BY THE INDIRECT PHOTOCHEMICAL METHOD

Fernande Botter nee Bergheaud, Gif-sur-Yvette; Monique Scaringella nee Desnoyer, Versailles, and Michel Waconge, Epinay-sur-Orge, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Oct. 1, 1973, Ser. No. 402,356
Claims priority, application France, Oct. 26, 1972, 72.38033
Int. Cl.[2] B01J 1/10
U.S. Cl. 204—157.1 R 11 Claims

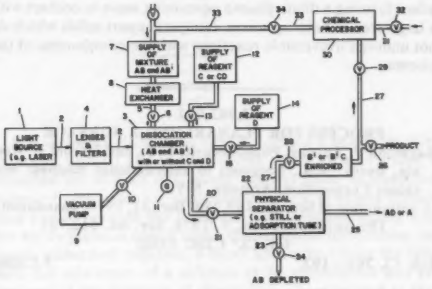
1. A method of photochemical separation of the mercury isotopes comprising the steps of passing through at least one vessel mounted in series, a gas stream of oxygen and butadiene containing a mixture of mercury isotopes, irradiating said gas stream by a lamp containing mercury depleted in at least one of the desired isotopes and then recovering said desired isotopes in a trap placed downstream of the vessels.

3,983,020

ISOTOPIC SEPARATION BY PHOTOPREDISSOCIATION

C. Bradley Moore, Berkeley, Calif., and Edward S. Yeung, Ames, Iowa, assignors to The Regents of the University of California, Berkeley, Calif.

Filed Jan. 26, 1973, Ser. No. 326,833
Int. Cl.[2] B01J 1/10
U.S. Cl. 204—157.1 R 17 Claims


CHEMICAL PROCESSOR
SUPPLY OF MIXTURE AB and AB'
SUPPLY OF REAGENT C or CD
HEAT EXCHANGER
SUPPLY OF REAGENT D
LIGHT SOURCE (e.g. LASER)
LENSES & FILTERS
DISSOCIATION CHAMBER (AB and AB') with or without C and D
B' or B' C ENRICHED
PRODUCT
VACUUM PUMP
PHYSICAL SEPARATOR (e.g. STILL or ADSORPTION TUBE)
AB or A
AB DEPLETED

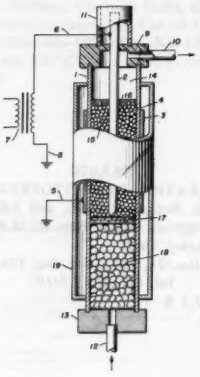
1. A method for producing isotopically enriched material by photoexcitation of dissociable molecules in which at least one element is present as a plurality of isotopes, those said molecules which contain a first said isotope having a significantly greater tendency to absorb a given spectrum range of light and to be raised to an excited electronic state and to be dissociated thereby, than do those said molecules which contain a second said isotope, comprising the steps of:
submitting said dissociable molecules to light in said given spectrum range, to cause said molecules to be raised to said excited electronic state, thereby dissociating said molecules containing said first isotope, said first isotope entering into a different stable chemical state, and
physically separating the matter constituting said first isotope in its different chemical state from the remainder of said matter.

3,983,021

NITROGEN OXIDE DECOMPOSITION PROCESS

Jay M. Henis, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed June 9, 1971, Ser. No. 151,396
Int. Cl.[2] B01K 1/00
U.S. Cl. 204—164 26 Claims



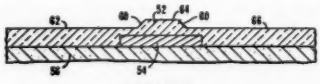
1. The process of decomposing nitrogen oxides which comprises forming a dilute plasma containing same in contact with a large area of heterogeneous catalyst support solids which do not undergo irreversible reactions with the components of the plasma.

3,983,022

PROCESS FOR PLANARIZING A SURFACE

Raymond P. Auyang, Poughkeepsie, N.Y., and Harold R. Koenig, Derry, N.H., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 103,250, Dec. 31, 1970, abandoned.
This application Oct. 7, 1974, Ser. No. 512,781
Int. Cl.[2] C23C 15/00
U.S. Cl. 204—192 3 Claims



1. A method of providing a planar surface on an insulating film of a thin film device, wherein said insulating film overlies a metal stripe which is on a substrate, the portion of said film over said stripe forming an upper first substantially flat surface in a first plane, the portion of said film on said substrate forming lower second substantially flat surfaces in a second plane, the portions of said insulating film between said first and second surfaces being sloped, comprising:

sputter etching said sloped portions while not affecting said metal stripe until the total surface of said insulating film substantially lies in said second plane.

2. A method of providing a planar surface on an insulating film of a thin film device, wherein said insulating film is being sputter deposited on a metal stripe lying on a substrate, the portion of said film over said stripe forming an upper first substantially flat surface in a first plane, the portion of said film on said substrate forming lower second substantially flat surfaces in a second plane, the portions of said film between said first and said second surfaces being sloped, comprising:

resputtering said insulating film while not affecting said metal stripe, said resputtering being adjusted to produce substantially zero deposition on said flat surfaces whereby said sloped surfaces are sputter etched, said resputtering being carried on until the surface of said insulating film lies in said second plane.

3. A method of providing a planar surface on the insulating film of a thin film device, wherein said insulating film has been sputter deposited on a metal stripe lying on a substrate, the portion of said film over said stripe forming an upper first substantially flat surface in a first plane, the portion of said film on said substrate forming lower second substantially flat surfaces in a second plane, the portions of said film between said first and said second surfaces being sloped, comprising:

chemically etching a part of said portion of said film over said stripe and within said sloped surfaces to a depth substantially co-planar with said second plane while not affecting said metal stripe; and

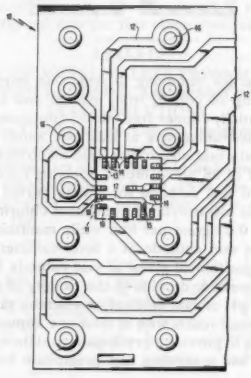
sputter etching said sloped surfaces until the total surface of said insulating film substantially lies in said second plane while not affecting said metal stripe.

3,983,023

INTEGRATED SEMICONDUCTOR CIRCUIT MASTER-SLICE STRUCTURE IN WHICH THE INSULATION LAYER BENEATH UNUSED CONTACT TERMINALS IS FREE OF SHORT-CIRCUITS

Theodore H. Baker; Majid Ghafghaichi, both of Poughkeepsie, and Daniel Tuman, Beacon, all of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Mar. 30, 1971, Ser. No. 129,430
Int. Cl.[2] C23C 15/00
U.S. Cl. 204—192 4 Claims



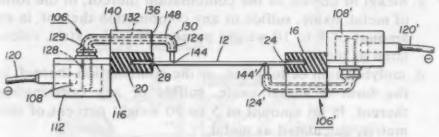
1. In the method of reverse cathodic sputtering to remove materials from the planar surface of a planar integrated circuit masterslice structure including the active and passive components formed from a plurality of regions of different conductivity types extending from said planar surface into said substrate, the improvement comprising:

protecting the portion of said insulative layer beneath at least one of said excess terminals not selectively connected into said circuit configuration against dielectric breakdown resulting from high electrostatic charge accumulations by connecting said one excess terminal to one of said excess electrically isolated components not selectively connected into said circuit configuration.

3,983,024
IN-LINE APPARATUS FOR ELECTROPLATING A METAL ONTO AN ARTICLE

Robert J. Boggio, Woodridge, Ill., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Feb. 24, 1975, Ser. No. 552,680
Int. Cl.² C25B *9/00*; B01K *1/00*
U.S. Cl. 204—198 **14 Claims**



1. In an apparatus for electroplating a metal onto an electrically conductive surface of an article moving through an electrolyte plating bath containing in solution a salt of the metal to be plated onto the article, by passing an electric current through the electrolyte and the article with the article functioning as a cathode:

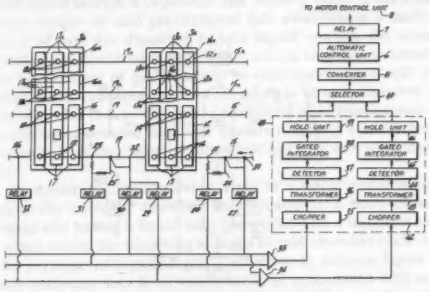
a pair of spaced tracks extending through the plating bath, for supporting and for guiding the moving article therealong and through the plating bath, and

means for electrically contacting the conductive surface of the article within the plating bath and for applying a voltage thereto to supply the electric current to the article to plate the metal onto the article.

3,983,025
APPARATUS FOR REGULATING ANODE-CATHODE SPACING IN AN ELECTROLYTIC CELL

Richard W. Ralston, Jr., Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 272,240, July 17, 1972, abandoned. This application July 18, 1974, Ser. No. 489,648
Int. Cl.² C25D *17/00, 21/12*; C25B *1/40*
U.S. Cl. 204—225 **9 Claims**



1. In an electrolytic cell having at least one adjustable anode set, at least one conductor conveying electric current to said at least one anode set, and a liquid cathode in spaced relation to said at least one anode set, the improvement which comprises employing, with said electrolytic cell, apparatus for adjusting the space between said at least one anode set and said liquid cathode, which comprises:

a. digital computer means programmed with a standard voltage coefficient and a permissible range of deviation for each anode set,

b. means for detecting voltage signals and current signals to each of said anode sets,

c. means for selecting from said detected signals a set of signals generated from a selected anode set,

d. means for supplying said selected signals in digital form to said digital computer means,

e. said digital computer being programmed for calculating the voltage coefficient from said detected signals in digital form for said selected anode set and comparing said voltage coefficient with said permissible range,

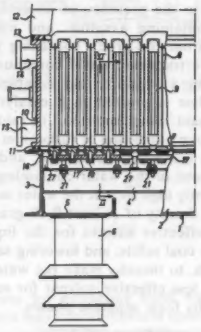
f. said digital computer being programmed for generating activating electric signals when said calculated voltage coefficient is outside of said permissible range, and

g. motor means operative to raise and lower said selected anode set, said motor means being energized by said activating electric signals when said calculated voltage coefficient is outside of said permissible range.

3,983,026
ELECTROLYTIC CELLS WITH VERTICAL ELECTRODES

Emile Cabaraux, and Robert Schoberle, both of Brussels, Belgium, assignors to Solvay & Cie, Belgium

Filed Oct. 7, 1974, Ser. No. 512,912
Claims priority, application Belgium, Oct. 19, 1973, 136867
Int. Cl.² C25B *1/26, 9/02*
U.S. Cl. 204—258 **13 Claims**



1. A unipolar electrolytic cell comprising a baseplate, substantially vertical and parallel anode plates each of which is mounted on at least one anode support fixed in leakproof manner to the baseplate and connected to at least one current lead placed beneath the baseplate, cathodes alternating with the anode plates, a casing above the baseplate surrounding the anode plates and cathodes, a cover above the casing the conduits for admission of a solution to be electrolysed and for removal of the products of electrolysis, characterised in that the current lead rests on at least one fixed prop and supports and said anode support and that the said anode support passes through the baseplate and supports at least a part of the baseplate above the current lead.

3,983,027
PROCESS FOR RECOVERING UPGRADED PRODUCTS FROM COAL

John D. McCollum, Munster, Ind., and Leonard M. Quick, Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed July 1, 1974, Ser. No. 484,594
Int. Cl.² C10G *1/04*
U.S. Cl. 208—8 **17 Claims**

1. A process for recovering upgraded products from coal solids, comprising contacting the coal solids with a water-containing fluid to thereby produce gases, liquids, and upgraded solids from the coal solids, under supr-atmospheric pressure, at a temperature in the range of from about 600°F. to about 900°F. in the absence of an externally supplied catalyst and hydrogen or other reducing gas, wherein sufficient water is present in the water-containing fluid and said pressure is sufficiently high so that the water in the water-containing fluid has a density of at least 0.10 gram per milliliter and serves as an effective solvent for the liquids and gases produced from

the coal solids; and lowering said temperature or pressure or both, to thereby make the water in the water-containing fluid a less effective solvent for such liquids and gases and to thereby form separate phases.

3,983,028
PROCESS FOR RECOVERING UPGRADED PRODUCTS FROM COAL

John D. McCollum, Munster, Ind., and Leonard M. Quick, Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

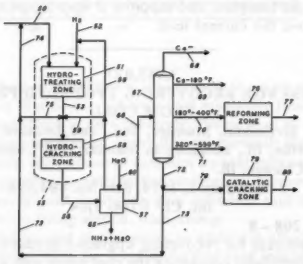
Filed July 1, 1974, Ser. No. 484,592
Int. Cl.² C10G *1/04*
U.S. Cl. 208—9 **25 Claims**

1. A process for recovering upgraded products from coal solids, comprising contacting the coal solids with a water-containing fluid, to thereby produce gases, liquids, and upgraded solids from the coal solids, under super-atmospheric pressure, at a temperature in the range of from about 600°F. to about 900°F. in the absence of externally supplied hydrogen or other reducing gas, and in the presence of an externally supplied catalyst system containing a sulfur- and nitrogen-resistant catalyst, selected from the group consisting of at least one soluble or insoluble transition metal compound, a transition metal deposited on a support, and combinations thereof, wherein said catalyst is present in a catalytically effective amount, wherein said transition metal in said catalyst is selected from the group consisting of ruthenium, rhodium, iridium, osmium, and combinations thereof, and wherein sufficient water is present in the water-containing fluid and said pressure is sufficiently high so that the water in the water-containing fluid has a density of at least 0.10 gram per milliliter and serves as an effective solvent for the liquids and gases produced from the coal solids; and lowering said temperature or pressure or both, to thereby make the water in the water-containing fluid a less effective solvent for such liquids and gases and to thereby form separate phases.

3,983,029
HYDROTREATING CATALYST AND PROCESS

Robert J. White, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 337,518, March 2, 1973, Pat. No. 3,954,671, and a continuation-in-part of Ser. No. 27,068, April 9, 1970, abandoned. This application Nov. 24, 1975, Ser. No. 634,993
Int. Cl.² C10G *13/02, 23/02;* B01J *27/04*
U.S. Cl. 208—59 **8 Claims**



1. A hydrotreating process which comprises contacting a hydrocarbon feed containing substantial amounts of materials boiling above 200°F. and selected from the group consisting of petroleum distillates, solvent-deasphalted petroleum residua, shale oils and coal tar distillates, in a reaction zone with hydrogen and a catalyst, at hydrotreating conditions including a temperature in the range 400°to 950°F., a pressure in the range 800 to 3500 psig, a liquid hourly space velocity in the range 0.1 to 5.0, and a total hydrogen supply rate of 200 to 20,000 SCF of hydrogen per barrel of feedstock, and recovering hydrotreated products from said reaction zone, said catalyst being a composite comprising

A. A gel matrix comprising based on the entire content of said gel matrix:
a. less than 15 weight percent silica,
b. alumina, in an amount providing an alumina-to-silica weight ratio of 50/50 to 100/0,
c. nickel or cobalt, or the combination thereof, in the form of metal, oxide, sulfide or any combination thereof, in an amount of 1 to 10 weight percent of said matrix, calculated as metal,
d. molybdenum or tungsten, or the combination thereof, in the form of metal oxide, sulfide or any combination thereof, in an amount of 5 to 30 weight percent of said matrix, calculated as metal;

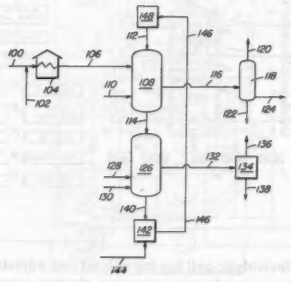
B. A crystalline zeolitic molecular sieve containing less than 5 weight percent sodium and containing ions selected from Mn, rare earths of atomic numbers 58–71, and alkaline earths Mg, Ca, Sr and Ba, said sieve further being in the form of particles, said particles being dispersed through said gel matrix;

said catalyst having an average pore diameter below 100 Angstroms and a surface area above 200 square meters per gram.

3,983,030
COMBINATION PROCESS FOR RESIDUA DEMETALATION, DESULFURIZATION AND RESULTING COKE GASIFICATION

Michael P. Rosynek, Bryan, Tex.; George F. Shipman, and Tsoung-Yuan Yan, both of Trenton, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 1, 1974, Ser. No. 438,916
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976
Int. Cl.² C10J *3/00;* C10G *9/30;* C10B *55/00;* B01D *15/06*
U.S. Cl. 208—253 **13 Claims**



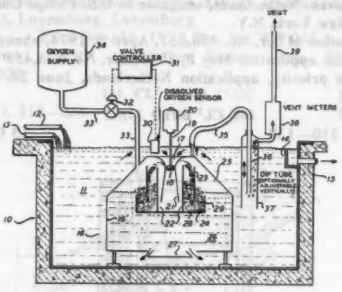
1. A process for residual oil demetalation and desulfurization and resulting coke gasification which comprises contacting said residual oil with a porous refractory oxide in the absence of added hydrogen, at a temperature of from greater than 700°F to about 1100°F and a porous refractory oxide to oil weight ratio of from about 0.1 to about 5, recovering from said residual oil contacting step upgraded residual oil of cracking feed quality and coke-deposited refractory oxide, contacting said coke-deposited refractory oxide with steam and a free oxygen containing gas at a temperature of from about 1000°F to about 1500°F and a mole ratio of steam to oxygen of from about 3 to about 5, and recovering from said coke-deposited refractory oxide contacting step producer gas and regenerated coke-free refractory oxide.

3,983,031

METHODS AND APPARATUS FOR CONTROLLING THE SUPPLY OF A FEED GAS TO DISSOLUTION DEVICES

Bradley S. Kirk, North Plainfield, N.J., assignor to Airco, Inc., Montvale, N.J.

Filed Apr. 2, 1975, Ser. No. 564,528
Int. Cl.² C02C 5/04; C02B 3/08
U.S. Cl. 210—15 7 Claims



1. A method of dissolving a gas in a liquid in a generally enclosed chamber emplaceable in a body of said liquid, comprising the steps of: introducing said gas into said chamber thereby depressing liquid therein to a level corresponding to the pressure of said gas; pumping a stream of liquid into said chamber and establishing a gravitational fall of said liquid stream over a weir through said gas space whereby the resulting liquid-gas turbulence effects a mass transfer of said gas into said liquid; discharging said liquid with said gas dissolved therein through a nozzle into said body of liquid; limiting the height of said gravitational fall of said liquid by placing a tube having a lower end in said body of liquid and disposed in communication with said gas space with the lower end of said tube defining the lowest level within said chamber to which said liquid therein is depressed and thereby defining the maximum height of said gravitational fall; establishing a desired level of said gas dissolved in said liquid; sensing the actual level of gas dissolved in said liquid; and, in response to sensing an actual level of gas dissolved in said liquid above said desired level, reducing the flow of said gas to said chamber to thereby also reduce the power consumed as a consequence of pumping said liquid into said chamber against a lower head pressure resulting from reducing said gas flow into said chamber.

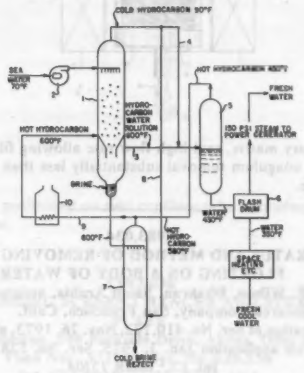
4. Apparatus for dissolving a gas in a liquid comprising a generally enclosed chamber emplaceable in a body of said liquid and having a liquid inlet and outlet with a nozzle at said outlet; means for supplying said gas to said chamber such that the pressure of supplied gas is effective to depress liquid in said enclosure to a level which varies in accordance with said gas pressure; gravitational fall means including a weir and a baffle spaced from said weir to define a gravitational fall zone intermediate said inlet and outlet; pump means for pumping said liquid through said inlet and subjecting said pumped liquid to a gravitational fall over said weir into said fall zone through said gas space to effect a mass transfer of said gas into said liquid; means for discharging said liquid with gas dissolved therein through said nozzle; dip tube means at least partially disposed in said body of liquid and in communication with said gas space for limiting the maximum gas pressure in said space thereby defining a maximum height of said gravitational fall; means for sensing the concentration of gas dissolved in said body of liquid and means responsive to said sensing means for controlling the flow of said gas to said chamber in accordance with said sensed concentrations such that upon sensing a dissolved gas concentration in said body of liquid above a desired level said control means is effective to reduce said gas flow to thereby reduce the power consumed by said pump means as a consequence of pumping said liquid against a lower pressure head resulting from the reduced gas flow into said chamber.

3,983,032

BRINE DESALINATION PROCESS WITH PHASE-BREAKING BY COLD HYDROCARBON INJECTION

Howard V. Hess, Glenham, and William F. Franz, Gardiner, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Jan. 30, 1975, Ser. No. 545,269
Int. Cl.² B01D 11/00
U.S. Cl. 210—22 R 5 Claims



1. In a process for extracting fresh water from brine by passing said brine into countercurrent contact with hot hydrocarbon under pressure of 700 to 2500 psig at temperature of 500° to 650°F in a first contacting zone whereby a hydrocarbon-water solution is formed as well as concentrated brine and a cooled recycle hydrocarbon at a temperature of 70° to 200°F the improvement which consists in injecting said solution directly with substantially all of said cooled hydrocarbon to cause said solution to separate into water and hydrocarbon and separating said water from said hydrocarbon.

3,983,033

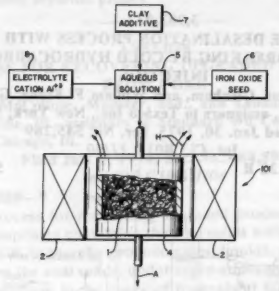
PROCESS FOR REMOVING DISSOLVED PHOSPHORUS FROM WATER MAGNETICALLY

Christopher de Latour, Arlington, Va., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 344,808, March 26, 1973, abandoned. This application Mar. 12, 1975, Ser. No. 557,841
Int. Cl.² C02B 1/20
U.S. Cl. 210—49 10 Claims

1. A process for removing orthophosphate ions from an aqueous solution containing suspended solids, comprising, introducing iron oxide seed material particles at about 100–1000 parts per million in the size range >0.1 microns into said aqueous solution, introducing an electrolyte cation selected from the group consisting essentially of the metal ions Al^{+3}, Fe^{+3}, Ca^{+2} and Fe^{+2} at about 3–10 parts per million into said aqueous solution, said electrolyte cation acting first to associate with itself said orthophosphate ions and, second, to associate through metal ion hydroxo bridges said iron oxide, said bridges having also complexed some of said orthophosphate ions, agitating the solution, allowing a retention time of the order of one to three minutes for a coagulum containing said orthophosphate ions to form, said solution containing sufficient suspended solids to permit said coagulum to form, and then magnetically filtering said aqueous solution to separate the coagulum from the liquid portion of the aqueous

solution by passing said aqueous solution at a high flow rate through magnetic filtering means comprising a magnetized filamentary matrix, said high flow rate allowing filter contact time for coagulum removal substantially less than said retention time.



3,983,034

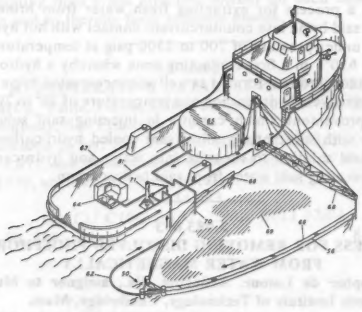
APPARATUS AND METHOD OF REMOVING DEBRIS FLOATING ON A BODY OF WATER

Donald E. Wilson, Dhahran, Saudi Arabia, assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 410,122, Nov. 26, 1973, abandoned. This application Jan. 3, 1975, Ser. No. 538,494

Int. Cl.² E02B *15/04*

U.S. Cl. 210—73 W **9 Claims**



1. Apparatus for collecting liquid and separating debris floating on a body of water comprising:

a plurality of adjustably buoyant pontoons;

a means for interconnecting said pontoons;

a sloping plate for directing the flow of the liquid, debris and water a predetermined way, said plate connected between two of said pontoons;

a plurality of vertical screens for separating said debris floating on said water from said liquid and said water, said screens secured at the upper terminus of said sloping plate;

a quieting area plate contiguous with said sloped plate and connected to said interconnecting pontoon means;

a container having a closed lower bottom end and an open upper top end, said container's perimeter secured to said quieting area plate;

a flexible liquid impregnable open ended conic section operatively connected to the upper top end of said container;

a guided float within said container, said float operatively connected to said conic section; and

means for transporting said liquid away from said apparatus.

3,983,035

BALANCING DEVICE FOR A ROTATABLE DRUM WHICH MAY BE ECCENTRICALLY LOADED

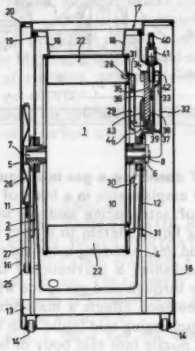
Robert Josef Arkeveld, and Hendrik Karel Moraal, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 458,551, April 8, 1974, abandoned. This application May 8, 1975, Ser. No. 575,455

Claims priority, application Netherlands, June 24, 1971, 7108702

Int. Cl.² B01D *33/02*

U.S. Cl. 210—138 **13 Claims**



1. In a balancing device for balancing an eccentrically loaded rotatable drum of the type comprising a drum, a plurality of containers carried on said drum for receiving and holding balancing material, each container having inlet and outlet openings, means for supplying balancing material to at least one of said containers, means for mounting said drum to permit rotation of said drum with respect to the mounting means and to permit eccentric movement of the drum, said mounting means undergoing similar eccentric movement in response to eccentric movement of the drum, and a control mechanism for controlling the amount and timing of balancing material supplied to said containers in response to eccentric movement of said mounting means, the improvement wherein

said supplying means comprises means for intermittently supplying a flow of balancing material along a path to an inlet region, said means for intermittently supplying comprising a first movable member, and means for conducting said flow of material from said inlet region to successive ones of said inlet openings in sequence as said drum rotates,

said control mechanism comprises means for coupling said first movable member to said mounting means for freely oscillatory movement in response to said eccentric movement and for developing a restoring force biasing said movable member toward a central position when said movable member is displaced from the central position, said restoring force being approximately proportional to the instantaneous distance by which said movable member is displaced from said central position along one rectangular coordinate direction, said central position being fixed in position with respect to said mounting means,

said first movable member being so arranged with respect to said inlet region as to divert all of said flow from said path to the inlet region while in said central position, and permit substantially all of said flow to pass to the region

while in a given position, over a range of movement from the central toward the given positions an increasing proportion of said flow passing to said inlet region.

3,983,036

METHOD AND DEVICE FOR UNCLOGGING FILTER CLOTHS

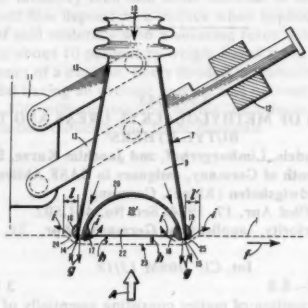
Jean Lauzeral, and Christian Laville, both of Gaillac, France, assignors to European Atomic Energy Community (Euratom), Luxemburg, Luxemburg

Filed Nov. 19, 1973, Ser. No. 417,206

Claims priority, application France, Nov. 21, 1972, 72.42328

Int. Cl.² B01D *35/20*

U.S. Cl. 210—356 **8 Claims**



1. Apparatus for cleaning a filter cloth, comprising: a nozzle having a head with a slot for ejecting a jet of cleaning gas, a part of which passes through the cloth; means for moving the cloth across said head; means for locating said nozzle at a minimal distance from the cloth, said locating means being responsive to a reaction of a jet of gas against the cloth, wherein said head has an internal profile such that gas is ejected from said slot at a speed which is within 20% of the speed of sound in air and in which the slot opens substantially perpendicular to the direction of movement of the cloth across said head, and wherein said means for locating includes, on the exterior of said head at opposite sides of said slot, outer lips of semi-cylindrical profile, said lips forming with the cloth when the cloth is moved across said head a bifurcated restricted path having branches about said lips for the part of the gas which does not pass through the cloth.

3,983,037

APPARATUS FOR TRANSFER, STORAGE, AND DISTRIBUTION OF LIQUID

Jae Yoon Lee, and Kuem Ja Lee, both of 1122 Sunny Hill Drive, Columbus, Ohio 43221

Filed Nov. 5, 1973, Ser. No. 413,025

Int. Cl.² A61M *1/00*

U.S. Cl. 210—416 R **1 Claim**

1. Apparatus for medical liquid analysis comprising a flexible liquid tube having an open end, a stopper sealing said open end having an aperture therethrough, a capillary tube passing through said aperture in said stopper and into said flexible tube, a hole in said capillary tube extending in said flexible tube and a projection on said capillary tube on the outside of said stopper, said capillary tube being constructed and arranged to shift between a first position wherein said hole is closed by said stopper and a second position wherein said projection abuts said stopper and said hole is in communication with the interior of said flexible tube, said flexible tube when flexed causes liquid to be sucked up when said capillary tube is in said first position when flexed causes liquid to be expelled when said capillary tube is in said second position;

and a filter positioned on said capillary tube extending in said flexible tube.

3,983,038

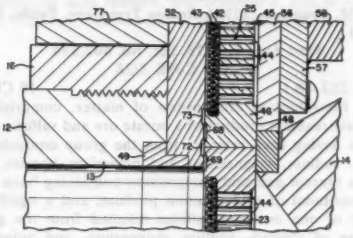
SELF-PURGING SCREEN CHANGER AND STRAINER PLATE

Eugene E. Heston, 548 Parkside Drive, Akron, Ohio 44313

Filed Nov. 3, 1975, Ser. No. 628,536

Int. Cl.² B01D *35/00;* **B29F** *3/01*

U.S. Cl. 210—447 **14 Claims**



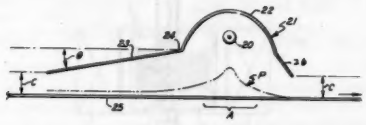
1. In combination, a strainer plate for a screen changer having a slot through which said strainer plate is moved from a storage position to an operating position in an opening for straining extruded material, said strainer having a leading edge, a trailing edge, a central strainer portion, a supporting portion surrounding said strainer portion, said supporting portion having a surface in sealing engagement with a sealing plate on said screen changer, a groove in said surface extending in a direction from said leading edge to said central strainer portion, said groove being closed by said sealing plate when said strainer is in said storage position and said groove being open and in communication with said central strainer portion and said opening in a preliminary change position of said strainer with said strainer moved a predetermined distance from said storage position towards said operating position for prefilling said central strainer portion in the storage position and venting air out of said central strainer portion prior to movement of the strainer from said preliminary change position to said operating position.

3,983,039

NON-SYMMETRICAL REFLECTOR FOR ULTRAVIOLET CURING

Bernard J. Eastland, Olney, Md., assignor to Fusion Systems Corporation, Rockville, Md.

Filed Mar. 3, 1975, Ser. No. 555,335
Int. Cl.² H01J 37/20
U.S. Cl. 250—492 R 14 Claims



1. A lamp unit for use in curing photosensitive inks and coatings comprising a single elongated tubular ultraviolet lamp mounted in a reflector, said reflector being comprised of a first reflecting means partially surrounding said lamp for providing a region of peaked relatively high intensity illumination and a second reflecting means for providing a region of tapered relatively lower intensity illumination, said first reflecting means comprising a continuous curved surface having an axis of revolution, said second reflecting means comprising a plane surface extending outwardly from said curved surface and joining said curved surface at an obtuse angle so that said tapering increases in the outward direction of said plane surface, said lamp being mounted so that its longitudinal dimension is parallel to said axis of revolution.

3,983,040

FIRE-RETARDANT COMPOSITION AND PROCESS OF PRODUCING SAME

Samuel M. Draganov, 17966 Orange Tree Lane, Tustin, Calif. 92680

Filed Aug. 7, 1975, Ser. No. 602,554
Int. Cl.² C09K 3/28
U.S. Cl. 252—8.1 10 Claims

1. A fire-retardant compositon of matter, comprising a particulate reaction product of a borate ore and sulfuric acid, said one having been selected from the group consisting of calcium, sodium, magnesium, and potassium borates, and mixtures thereof and said composition containing boric acid as a constituent of said reaction product, and a significant quantity of one or more sulfates selected from the group consisting of calcium, sodium, magnesium, and potassium sulfates, as a constituent of said reaction product.

3,983,041

RUST INHIBITOR FOR MONO- OR POLYUREA GREASES

Andrew D. Abbott, Greenbrae, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 560,277, March 19, 1975, abandoned. This application Jan. 22, 1976, Ser. No. 651,664
Int. Cl.² C10M 3/18, 5/14, 7/20, 7/24
U.S. Cl. 252—17 12 Claims

1. A grease composition comprising: (1) a major portion of an oil of lubricating viscosity; (2) from 0.5 to 20 weight percent of a water- and oil-insoluble mono- or polyurea thickening agent having a molecular weight between about 350 and 2500; (3) from 3 to 30 weight percent of an alkaline earth metal carbonate or aliphatic monocarboxylate having from 1 to 3 carbons; and (4) from 0.1 to 10 weight percent of a Mannich base prepared by reacting alkylphenol having from 1 to 4 carbon atoms in the alkyl groups with formaldehyde and an amine selected from the class consisting of dialkanolamine, N,N-dialkanolalkylenediamine and dialkylamine.

3,983,042

WATER-BASED FORGING LUBRICANT

Sulekh C. Jain, Shrewsbury, and Charles A. Morris, Grafton, both of Mass., assignors to Wyman-Gordon Company, Worcester, Mass.

Filed Oct. 24, 1975, Ser. No. 625,592
Int. Cl.² C10M 3/18, 5/14, 7/20; B21B 45/02
U.S. Cl. 252—18 9 Claims

1. A forging lubricant comprised of
a. water base, and minor effective amounts of
b. organic thickener selected from the group consisting of sodium carboxymethylcellulose and hydroxypropylcellulose,
c. graphite,
d. sodium molybdate, and
e. sodium pentaborate.

3,983,043

MIXTURES OF METHYLOLALKYL UREAS AND THEIR BUTYL ETHERS

Johann Brandeis, Limburgerhof, and Joachim Kurze, Leutershausen, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Apr. 17, 1974, Ser. No. 461,502
Claims priority, application Germany, Apr. 21, 1973, 2320302
Int. Cl.² D06M 13/18
U.S. Cl. 252—8.8 3 Claims

1. A composition of matter consisting essentially of a mixture of
a. at least one mono- and/or di-methylolalkyl urea having from 12 to 22 carbon atoms in the alkyl radical and
b. at least one butyl ether of a mono- and/or di-methylolalkyl urea having from 12 to 22 carbon atoms in the alkyl radical,
the ratio of (a) to (b) in said mixture being from 2:1 to 1:2 by weight.

3,983,044

LOW SMOKING LUBRICATING COMPOSITION FOR COLD HEADING OPERATIONS

George F. Felton, Jr., Chadds Ford, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Continuation-in-part of Ser. No. 457,040, April 1, 1974, abandoned. This application June 16, 1975, Ser. No. 587,511
Int. Cl.² C10M 1/54, 1/38
U.S. Cl. 252—33.6 7 Claims

1. A normally liquid composition useful as a cold forming, metal working lubricant comprising:
a. 45 to 200 parts by weight of water;
b. 30 to 35 parts by weight of a block copolymer of ethylene oxide grafted on a polypropylene oxide which copolymer has both a molecular weight range and ethylene oxide content sufficient to cause the composition to remain homogeneous between ambient temperature and the boiling temperature of the composition;
c. 1 to 15 parts by weight of a potassium soap of a sulfurized naturally occurring triglyceride containing from 5 to 25 weight percent sulfur;
d. 1 to 10 parts by weight of a potassium soap of a chlorinated naturally occurring triglyceride containing from 25 to 50 weight percent chlorine; and
e. 0.5 to 10 parts by weight of potassium nitrite.

3,983,045

THREE COMPONENT DEVELOPER COMPOSITION

Don B. Jugle, Penfield, and Charles J. Levine, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 188,570, Oct. 12, 1971, abandoned. This application Feb. 19, 1974, Ser. No. 443,659

Int. Cl.[2] G03G 9/02

U.S. Cl. 252—62.1 P 4 Claims

1. A composition for development of electrostatographic images comprising discrete particles and carrier, said particles including discrete, finely divided electroscopic toner materials having an average particle size of less than about 30 microns; from about 0.01 to about 10 percent by weight based on the weight of said toner of a discrete, finely divided, solid, friction-reducing material having a hardness less than said toner material and having greater friction-reducing characteristics than said toner material, said friction-reducing material having a greater tendency than said toner material of forming a thin, adherent film deposit on a surface when applied from a mixture of said materials with a shearing force; and from about 0.01 to about 10 percent by weight based upon the weight of said toner of a discrete, finely divided, nonsmearable abrasive material having an average particle size between about 1 and about 500 millimicrons and having a hardness greater than said friction-reducing and toner materials.

3,983,046

FUNCTIONAL FLUID COMPOSITIONS CONTAINING EPOXY ADDITIVES

Martin B. Sheratte, Reseda, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

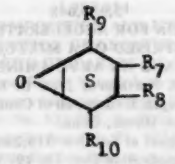
Continuation-in-part of Ser. Nos. 400,122, Sept. 24, 1973, Pat. No. 3,957,837, and Ser. No. 449,623, March 11, 1974, Pat. No. 3,935,116. This application May 20, 1974, Ser. No. 471,464

The portion of the term of this patent subsequent to Jan. 27, 1993, has been disclaimed.

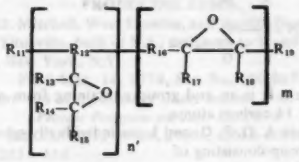
Int. Cl.[2] C10M 3/40

U.S. Cl. 252—78.5 33 Claims

1. A functional fluid composition consisting essentially of (1) a combination of at least two phosphate esters, one of said phosphate esters containing at least two groups selected from the class consisting of alkyl and alkoxyalkyl, and mixtures thereof, and a second of said phosphate esters containing at least two aromatic groups selected from the class consisting of aryl and alkaryl groups, and mixtures thereof, (2) a combination of at least two polyalkylene glycol materials having terminal groups selected from the class consisting of free hydroxyl and ether groups, said ether groups being oxyalkyl groups wherein the alkyl radicals contain from about 1 to about 8 carbon atoms, said alkylene groups being selected from the class consisting of ethylene and propylene radicals, one of said polyalkylene glycol materials having a molecular weight ranging from about 500 to about 2,000, and a second of said polyalkylene glycol materials having a molecular weight ranging from about 2,000 up to about 25,000, said phosphate esters and said polyalkylene glycol ethers being present in amounts such that said composition has a viscosity at −65°F of not greater than about 6,000 centistokes, and a viscosity at 210°F of not less than 2.25 centistokes, and (3) a small amount of an epoxy compound sufficient to function as an acid scavenger and to prevent precipitation of deposits in said fluid in the presence of said glycol materials, said epoxy compound selected from the group consisting of (A) a compound having the formula



wherein R_7 is $-(CH_2)_{0-3}$ -C(O)OR, -C(O)R, -OR, or $-CH_2OR$, where R is an alkyl radical having from 1 to about 12 carbon atoms, R_8 is R_7, hydrogen, or an alkyl radical having from 1 to about 9 carbon atoms, and R_9 and R_{10} are individually hydrogen or an alkyl radical having from 1 to about 4 carbon atoms, and (B) a polyepoxide having the general formula



wherein R_{11}, R_{12}, R_{14}, R_{15}, R_{17}, R_{18} and R_{19} can be a member selected from the group consisting of hydrogen, alkyl having from 1 to about 8 carbon atoms, aryl of from about 6 to about 8 carbon atoms, and wherein R_{13} and R_{14}, R_{17} and R_{18}, together, respectively, can be the carbon atoms necessary to complete a cycloalkyl group of from about 5 to about 6 carbon atoms, R_{18} and R_{16} are trivalent and divalent organic radicals, respectively, containing from 1 to about 20 carbon atoms, selected from the group consisting of alkyl, aryl, amino alkyl, amino aryl, ether, polyether, carboxylic acid ester and dicarboxylic acid radicals, and wherein n' and m can range from 0 to 100, but wherein n' plus m equals at least 2.

3,983,047

DECAL REMOVAL COMPOSITION

James H. Vinson, Philadelphia, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 528,114, Nov. 29, 1974, Pat. No. 3,920,472. This application Aug. 22, 1975, Ser. No. 606,917

Int. Cl.[2] C11D 9/30

U.S. Cl. 252—119 3 Claims

1. A composition comprising, on a volume basis:

xylene	54–58%
mineral spirits	10.5–11.5%
methyl isobutyl ketone	32–34%.

3,983,048

COMPOSITION FOR ACCELERATING OXYGEN REMOVAL COMPRISED OF A MIXTURE OF AQUEOUS HYDRAZINE AND AN ARYL AMINE COMPOUND

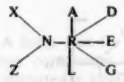
Henry W. Schiessl, Northford; John D. Kaufman, Prospect, and David A. Csejka, Orange, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 318,286, Dec. 26, 1972, abandoned. This application Dec. 10, 1973, Ser. No. 423,042 The portion of the term of this patent subsequent to Oct. 22, 1991, has been disclaimed.

Int. Cl.² C02B *1/18*

U.S. Cl. 252—178 9 Claims

1. A composition for the removal of dissolved oxygen from liquids or gases comprised of a mixture of an aqueous solution of hydrazine and a catalytic proportion of an aryl amine compound having the formula



a. wherein R is an aryl group containing from about 6 to about 14 carbon atoms;

b. wherein A, D, E, G, and L are individually selected from the group consisting of

1. amine
2. hydrogen
3. sulfonic acid
4. alkali metal salts of sulfonic acid
5. carboxylic acid
6. alkali metal salts of carboxylic acid
7. sulfuric acid
8. alkali metal salts of sulfuric acid
9. alkyl having from 1 to 4 carbon atoms, and
10. haloalkyl having from 1 to 4 carbon atoms

wherein at least one of said substituents is other than hydrogen;

c. wherein X and Z are individually selected from the group consisting of hydrogen and alkyl having from 1 to 4 carbon atoms, and

d. wherein N is nitrogen.

3,983,049

LIQUID CRYSTAL COMPOSITIONS WITH POSITIVE DIELECTRIC ANISOTROPY

Siegfried Aftergut, Schenectady, and Herbert S. Cole, Jr., Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 2, 1974, Ser. No. 466,384

Int. Cl.² C09K *3/34*; G02F *1/13*

U.S. Cl. 252—299 9 Claims

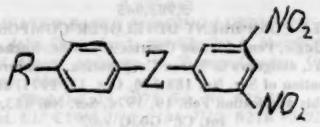
1. A liquid crystal composition having positive dielectric anisotropy comprising:

a negative dielectric anisotropy liquid crystal material; and a non-liquid crystal material comprising N-[p-(n-octyloxy) benzylidene]-p-nitroaniline, said non-liquid crystal material having no mesophase at any temperature and comprising more than zero percent and less than 15% of said composition.

7. A liquid crystal composition having positive dielectric anisotropy comprising:

a negative dielectric anisotropy liquid crystal material; and

a non-liquid crystal aromatic material, having no mesophase at any temperature, comprising more than zero percent and less than 15% of said composition, having a general formula:



where substituent R is selected from the group consisting of alkyl, dialkylamino, alkyloxy and hydrogen; and Z is selected from the group consisting of Schiff Base, ether, ester and direct bonds.

3,983,050

METHOD FOR STORAGE OF SOLID WASTE

William J. Mecham, La Grange, Ill., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Feb. 7, 1975, Ser. No. 548,058

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.² G21F *5/00*

U.S. Cl. 252—301.1 W 7 Claims

1. In the method of storing high-level radioactive liquid wastes by calcining the waste to remove the liquid, thereby forming a high-level radioactive calcine, placing the calcine in a metal canister, sealing the metal canister and placing the sealed metal canister in a moisture-containing environment for cooling and long-term storage, the improvement comprising: adding powdered portland cement to the canister containing the calcined wastes so that the cement is in contact with the inner surface of the wall of the canister before the canister is sealed, whereby, should the canister wall fail and develop an opening to the environment, moisture from the environment will enter the canister, mix with the portland cement, forming concrete which will harden, seal the opening and prevent the escape of any radioactivity from the canister to the environment.

3,983,051

DOPED BERYLLIUM LANTHANATE CRYSTALS

Carl F. Cline, Mendham, and Robert C. Morris, Flanders, both of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Division of Ser. No. 422,450, Dec. 6, 1973, Pat. No. 3,866,142. This application Aug. 22, 1974, Ser. No. 499,720

Int. Cl.² C09K *1/46*

U.S. Cl. 252—301.4 R 3 Claims

1. A single crystal of doped beryllium lanthanate having the formula $Be_2La_{2-2x}Z_{2x}O_5$ wherein Z is a dopant selected from the group consisting of praseodymium, neodymium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium and mixtures thereof and wherein x is a positive value of about 0.001 to 0.2.

3,983,052

PROCESS FOR REJUVENATING AUTOMOBILE EMISSION CONTROL CATALYSTS

Dennis P. McArthur, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Apr. 7, 1975, Ser. No. 565,633

Int. Cl.² B01D *15/06*

U.S. Cl. 252—412 24 Claims

1. A process for the rejuvenation of an auto exhaust gas conversion catalyst comprising a Group VIII metal dispersed on a refractory oxide support, said catalyst having been previously utilized for the conversion of air pollutants in auto exhaust gases containing lead and phosphorus compounds with resultant deposition thereon of deactivating solids comprising lead and phosphorus compounds, which process comprises:

a. contacting said catalyst with an aqueous ammonium salt solution of at least about 0.1 M concentration at a temperature between about 20°C and the boiling temperature for at least about 10 minutes;
b. contacting the catalyst from step (a) with a sulfating gas for at least about 10 minutes at a temperature between about 200°C and about 800°C, said sulfating gas comprising sulfur dioxide as its essential active component;
c. contacting the sulfated catalyst from step (b) with an ammonium salt solution as defined in step (a) and under the same conditions as defined in step (a); and
d. recovering said catalyst with at least some of said lead and phosphorus deactivating solids removed therefrom, said catalyst being recovered in a substantially more active condition.

14. A process for the rejuvenation of an auto exhaust gas conversion catalyst comprising a Group VIII metal dispersed on a refractory oxide support, said catalyst having been previously utilized for the conversion of air pollutants in auto exhaust gases containing lead and phosphorus compounds with resultant deposition thereon of deactivating solids comprising inorganic compounds of lead and phosphorus which process comprises:
a. contacting said catalyst with a sulfating gas for at least about 10 minutes at a temperature between about 200° and about 800°C, said sulfating gas comprising sulfur dioxid. as its essential active component;
b. contacting the sulfated catalyst from step (a) with an aqueous ammonium salt solution of at least about 0.1 M concentration at a temperature between about 20°C and the boiling temperature for at least about 10 minutes; and
c. recovering said catalyst from said contacting with at least some of said lead and phosphorus deactivating solids removed therefrom, said catalyst being recovered in a substantially more active condition.

3,983,053

COATED ADSORBENT MATERIALS

James McNiven Courtney, Lenzie; Thomas Gilchrist, Ayr, both of Scotland, and Eric Hutton Dunlop, Sidcup, England, assignors to The University of Strathclyde, Glasgow, Scotland

Filed July 2, 1974, Ser. No. 485,150

Claims priority, application United Kingdom, July 5, 1973, 32059/73

Int. Cl.² B01D *13/00*

U.S. Cl. 252—430 8 Claims

1. A solute-adsorptive material composed of granules of an adsorbent capable of binding the solute and on the adsorbent granules of polymeric membraneous coating which is semipermeable to selected solute or solutes, the polymeric coating being a copolymer of a first comonomer, and a second comonomer, the first comonomer being selected from the group consisting of acrylic acid, methacylic acid, itaconic acid, acrylamide, hydroxyacrylamide, vinyl pyrrolidone, dimethylaminoethyl acrylate, diethylaminoethyl acrylate, dimethylaminoethyl methacrylate, diethylaminoethyl methacrylate and hydroxyethyl methacrylate and the second comonomer being selected from the group consisting of acrylonitrile, methacrylonitrile, 2-vinylpyridine, 2-methyl-5-vinylpyridne, styrene and the C_1 to C_8 alkyl esters and the tert-butylaminoethyl and hydroxypropyl esters of acrylic, methacrylic and itaconic acids.

3,983,054

CATALYTIC COMPOSITION AND ITS APPLICATIONS TO THE PRODUCTION OF UNSATURATED NITRILES AND TO THE OXIDATION OF OLEFINES

Vittorio Fattore, and Bruno Notari, both of San Donato Milanese, Italy, assignors to Snam Progetti S.p.A., Milan, Italy

Division of Ser. No. 133,886, April 14, 1971, Pat. No. 3,850,975. This application July 26, 1974, Ser. No. 492,222

Claims priority, application Italy, Apr. 14, 1970, 23270/70

Int. Cl.² B01J *27/02*; C07C *120/14*; C01B *19/00*

U.S. Cl. 252—439 5 Claims

1. A catalyst composition consisting of a mixture of uranium oxide and tellurium oxide wherein the Te/U atomic ratio is in the range from 2 to 5.

3,983,055

SYNTHETIC AMORPHOUS SILICAS OF PREDETERMINED PORE DISTRIBUTION METHOD OF PRODUCING SAME

Thomas O. Mitchell, West Trenton, and Darrell Duayne Whitehurst, Titusville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 14, 1974, Ser. No. 450,967

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² B01J *29/00, 29/06*; C01B *33/12*

U.S. Cl. 252—454 22 Claims

1. A synthetic amorphous solid having shape selective properties prepared by the steps of (1) hydrolyzing and (2) polymerizing at up to 200°C. in the presence of water a silane having the formula $R[Si]X_3$ wherein X is a hydrolyzable group R is a nonhydrolyzable group and [Si] is selected from the group consisting of $-Si\lessgtr$ and $-Si(R)_2-O-Si\lessgtr$ and (3) calcining the polymerized product wherein there is also present in the final calcined product in addition to silicon at least one member selected from the group consisting of groups IIIA, IVA, IVB, VA, VB, VIB VIIB and VIII of the Periodic Table the source of said member being present in the initial hydrolyzing step.

3,983,056

AQUEOUS EPOXY RESIN PAINT COMPOSITION

Minoru Hosoda, Yokohama; Eiichi Kasiwagi, Fujisawa; Fumio Murayama, Yokohama, and Kohei Isayama, Kamakura, all of Japan, assignors to Dai Nippon Toryo Co., Ltd., Osaka, Japan

Filed Sept. 25, 1974, Ser. No. 509,315

Claims priority, application Japan, Sept. 27, 1973, 48-108808; Sept. 27, 1973, 48-108809; Oct. 1, 1973, 48-110393; Dec. 24, 1973, 49-3633

Int. Cl.² C08J *3/00*; C08L *63/00*

U.S. Cl. 260—29.2 EP 7 Claims

1. An aqueous epoxy resin paint composition comprising an epoxy resin emulsion formed by emulsifying in water (A) 98 to 50% by weight of a bisphenol type epoxy resin and (B) 2 to 50% by weight of methyl-substituted bisphenol epoxy resins, with a non-ionic surface active agent, and a curing agent incorporated in said epoxy resin emulsion.

3,983,057

PROCESS FOR THE MANUFACTURE OF WATER-CLEAR COPOLYMER DISPERSIONS

Günther Illmann, and Norbert Mayer, both of Augsburg, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 30, 1974, Ser. No. 519,240

Claims priority, application Germany, Nov. 2, 1973, 2354680

Int. Cl.² C08L *31/02*

U.S. Cl. 260—29.6 TA 2 Claims

1. A process for the manufacture of an odorless and colorless aqueous copolymer dispersion which can be rendered

water-clear by the addition of ammonia and does not discolor by polymerizing acrylates, methacrylates, unsaturated acids and optionally a small amount of styrene in the presence of a mercapto compound as regulator, which comprises

a. polymerizing the monomers in the presence of from 0.1 to 5.0 % by weight, calculated on the weight of the monomers, of a mercapto compound having at least 2 SH groups in the molecule as regulator and

b. incorporating into the copolymer dispersion of from 0.1 to 5.0 % of hydrogen peroxide, calculated as H_2O_2 of 100 % strength on the weight of the monomers, at a temperature of from 60° to 95°C after completion of the polymerization.

3,983,058

PROCESS FOR PREPARING POLYURETHANE EMULSIONS

Masaaki Hirooka, and Shigeru Takeo, both of Tokyo, Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan

Filed Oct. 25, 1974, Ser. No. 518,074
Int. Cl.² C08L *75/06*
U.S. Cl. 260—29.2 TN **9 Claims**

1. A process for preparing a polyurethane emulsion which comprises:

reacting a semi-ester containing at least one OH group and at least one COOH group, which is produced by addition reaction of a poly-OH compound having two or more OH groups with a dicarboxylic acid anhydride, with a polyisocyanate compound having at least two NCO groups or an isocyanate prepolymer having at least two NCO groups produced by a reaction of said polyisocyanate compound with a polyoxy-alkylenepolyol or polyesterpolyol, wherein the ratio of the number of NCO groups in the polyisocyanate compound to the number of OH groups in the semi-ester compound is ≥ 2.0, whereby there is obtained an isocyanate compound containing a COOH group and at least two terminal NCO groups.

3,983,059

EMULSIFIER-FREE AQUEOUS DISPERSION USEFUL IN COATING COMPRISING AMINOPLAST RESIN AND POLYMER OF MONOETHYLENIC CARBOXYLIC ACID PREPARED BY POLYMERIZATION IN THE PRESENCE OF LOW MOLECULAR WEIGHT POLYHYDRIC ALCOHOL

Kazys Sekmakas, Chicago, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Division of Ser. No. 484,636, July 1, 1974, Pat. No. 3,947,399, which is a division of Ser. No. 258,890, June 1, 1972, Pat. No. 3,862,075. This application Mar. 27, 1975, Ser. No. 562,952
The portion of the term of this patent subsequent to Jan. 21, 1992, has been disclaimed.
Int. Cl.² C08L *61/20, 61/32*
U.S. Cl. 260—29.4 UA **8 Claims**

8. An aqueous dispersion of copolymer particles in water having molecular weight in the range of from 10,000–50,000 and which is stable in the absence of emulsifying agent, and which is produced by forming a liquid mixture consisting of monoethylenic monomers and from 2% up to about 20%, based on the weight of said monomers, of trihydric or tetrahydric aliphatic polyhydric alcohol having a molecular weight in the range of from 300 to 5000, said monomers providing a T_g of at least about 30°F. and including from 3 to 20% by weight of monoethylenic carboxylic acid, dispersing said mixture in water to form a dispersion, said dispersion including a free radical polymerization catalyst, subjecting the dispersed liquid mixture in said dispersion containing the said catalyst to agitation at an elevated polymerization temperature, with said monomers being in solution in a liquid mixture containing said polyhydric alcohol, until polymerization of said monomers has been completed, and then at least partially neutralizing the acid content of the copolymer particles which are formed with a base, and then adding to said dispersion from 2–40%, based on the total weight of resin, of a water dispersible aminoplast resin.

3,983,060

LOW TEMPERATURE GLAZING COMPOSITION

Douglas W. Dill, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed July 24, 1974, Ser. No. 491,589
Int. Cl.² C08L *33/12*
U.S. Cl. 260—29.6 RW **6 Claims**

1. A low temperature ceramic glazing composition consisting essentially of 25–75% by weight of an aqueous dispersion of a first acrylic resin having a monomer composition of 40–85% by weight methyl methacrylate, 45–15% by weight butyl acrylate and 0–15% by weight methacrylic acid, said dispersion having 15–25% non-volatiles and a pH of 8.5–10.5, and 75–25% by weight of a powdered resin composition having a particle size of about 100 to about 400 mesh consisting essentially of 96–80% by weight of a second acrylic resin having a monomer composition of 60–85% by weight methyl methacrylate and 40–15% by weight butyl acrylate having a weight average molecular weight of 10,000–20,000 and a Tg of greater than 45°C and 4–20% by weight of a pigment.

3,983,061

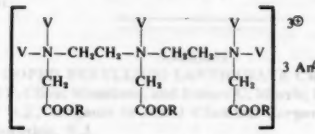
PROCESS FOR THE PERMANENT FINISHING OF FIBER MATERIALS

Josef Oxé, Arlesheim, and Rudolf Keller, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 226,511, Feb. 15, 1972, Pat. No. 3,835,148. This application June 4, 1974, Ser. No. 476,167
Int. Cl.² C08F *45/44*
U.S. Cl. 260—29.6 MN **9 Claims**

1. A preparation for use in giving fiber materials a permanent antistatic and dirt-repellent finish, consisting essentially of an aqueous dispersion of

a. 10 to 20% by weight of an antistatic agent comprising a compound of the formula



wherein

V represents a lower alkyl radical,

R represents an alkyl radical having 8 to 22 carbon atoms, and An^- represents an anion,

b. 3 to 35% by weight of an aqueous non-film-forming dispersion of polystyrene,

c. 1 to 6% by weight of an inorganic or organic monobasic or polybasic acid and

d. 0 to 5% by weight of an antimicrobic agent.

3,983,062

LATEX FROM CONJUGATED DIENE BUTYL RUBBER

Francis P. Baldwin, Summit, N.J.; Alberto Malatesta, Brussels, Belgium, and Charles P. O'Farrell, Clark, N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Aug. 9, 1974, Ser. No. 496,199
Int. Cl.² C08L *47/00*
U.S. Cl. 260—29.7 H **23 Claims**

1. A process for preparing latex from a copolymer of an isoolefin containing from 4 to 7 carbon atoms and a conjugated multi-olefin containing from 4 to 14 carbon atoms wherein said copolymer has been modified to have incorporated therein conjugated unsaturation, which comprises: (a) forming a cement by dissolving said copolymer in a hydrocarbon solvent; (b) forming an adduct of said copolymer by reacting the copolymer with an equimolar amount of an acid

anhydride dienophile, the concentration of the polymer adduct in said cement being 2 to 50 weight %; (c) forming an emulsion from said cement in water by contacting the cement with 50 to 200 **vol. % water based on the volume of the cement, the water containing an anionic or nonionic emulsifier, the quantity of emulsifier being** 3 to 20 parts per hundred parts of polymer; (d) neutralizing said emulsion with an inorganic or organic base to form a substantially homogeneous raw emulsion in ionomeric form; and (e) removing solvent and excess water to form a finished ionomeric latex, said latex consisting essentially of water and 5 to 70% by weight solids, said solids having a particle size of 0.1 to 3 microns.

3,983,063

SOLID, RAPID-SETTING, RIGID POLYURETHANES

Franciszek Olstowski, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 405,244, Oct. 10, 1973, which is a continuation-in-part of Ser. No. 327,630, Jan. 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 221,784, Jan. 28, 1972, abandoned. This application May 2, 1975, Ser. No. 574,157

Int. Cl.² C08K *5/45*

U.S. Cl. 260—30.2 **11 Claims**

1. A process for producing solid, rigid, polyurethane articles having a density of at least 1 g/cc, a percent elongation of less than 100, and which can be demolded within a period of about 5 minutes without the addition of an external source of heat, which process comprises

1. admixing, in the absence of a catalytic quantity of a catalyst for urethane formation, the components of a composition comprising
   A. an amine initiated polyol having an OH equivalent weight of from about 50 to less than about 250;
   B. an organic aromatic polyisocyanate;
   C. a liquid modifier having a boiling point above about 150°C selected from cyclic sulfones and mixtures thereof;

   wherein components (A) and (B) are present in quantities such that the NCO:OH ratio is from about 0.8:1 to about 1.5:1 and component (C) is employed in quantities of from about 5% to about 60% by weight of the combined weights of components (A), (B) and (C);
2. placing the admixed composition into a suitable mold wherein said composition solidifies within less than about 5 minutes to a solid having a density of at least 1 g/cc and a percent elongation of less than 100; and
3. subsequently demolding the resultant article from the mold.

3,983,064

SOLID, RAPID-SETTING, RIGID POLYURETHANES

Franciszek Olstowski, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 405,244, Oct. 10, 1973, which is a continuation-in-part of Ser. No. 327,630, Jan. 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 221,784, Jan. 28, 1972, abandoned. This application May 5, 1975, Ser. No. 574,497

Int. Cl.² C08K *5/15, 5/45*

U.S. Cl. 260—30.2 **13 Claims**

1. A process for producing solid, rigid, polyurethane articles having a density of at least 1 g/cc, a percent elongation of less than 100, and which can be demolded within a period of about 5 minutes without the addition of an external source of heat, which process comprises

1. admixing, in the absence of a catalytic quantity of a catalyst for urethane formation, the components of a composition comprising
   A. an amine initiated polyol having an OH equivalent weight of from about 50 to less than about 250;
   B. an organic aromatic polyisocyanate;
   C. a liquid modifier having a boiling point above about 150°C, said modifier consisting of a mixture, in any proportion, of at least two members selected, in any combination, from the group consisting of
      1. organic phosphates, phosphites, or phosphonates,
      2. cyclic ethers,
      3. aromatic compounds or partially hydrogenated aromatic compounds, such compounds being free of ester groups and groups reactive with NCO groups,
      4. chlorinated aliphatic compounds,
      5. cyclic sulfones,
      6. organic carbonates,
      7. esters of carboxylic acids,
      8. non-hydroxyl-containing polyoxyalkylene compounds,
      9. ester-modified polyoxyalkylene compounds having an average hydroxyl equivalent weight above about 700 when such compounds contain 2 hydroxyl groups, an average hydroxyl equivalent weight, above about 500 when such compounds contain 3 or more hydroxyl groups and an average molecular weight above about 700 when such compounds contain zero or 1 hydroxyl group; and
      10. hydroxyl-containing polyoxyalkylene compounds selected from the group consisting of
         a. such compounds having one or two hydroxyl groups per molecule and an average hydroxyl equivalent weight of at least about 700;
         b. such compounds having from about 3 to about 8 hydroxyl groups per molecule and an average hydroxyl equivalent weight of at least about 500;

   wherein components (A) and (B) are present in quantities such that the NCO:OH ratio is from about 0.8:1 to about 1.5:1 and component (C) is employed in quantities of from about 5% to about 60% by weight of the combined weight of components (A), (B) and (C);
2. placing the admixed composition into a suitable mold wherein said composition solidifies within less than about 5 minutes to a solid having a density of at least 1 g/cc and a percent elongation of less than 100; and
3. subsequently demolding the resultant article from the mold.

3,983,065

SOLID, RAPID-SETTING, RIGID POLYURETHANES

Franciszek Olstowski, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 405,244, Oct. 10, 1973, which is a continuation-in-part of Ser. No. 327,630, Jan. 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 221,784, Jan. 28, 1972, abandoned. This application May 1, 1975, Ser. No. 573,704

Int. Cl.² C08K *5/15*

U.S. Cl. 260—30.4 N **14 Claims**

1. A process for producing solid, rigid, polyurethane articles having a density of at least 1 g/cc, a percent elongation of less than 100, and which can be demolded within a period of about 5 minutes without the addition of an external source of heat, which process comprises

1. admixing, in the absence of a catalytic quantity of a catalyst for urethane formation, the components of a composition comprising
   A. an amine initiated polyol having an OH equivalent weight of from about 50 to less than about 250;
   B. an organic aromatic polyisocyanate;
   C. a liquid modifier having a boiling point above about 150°C selected from cyclic ethers and mixtures thereof;

   wherein components (A) and (B) are present in quantities such that the NCO:OH ratio is from about 0.8:1 to about 1.5:1 and component (C) is employed in quanti-

ties of from about 5% to about 60% by weight of the combined weights of components (A), (B), and (C);

2. placing the admixed composition into a suitable mold wherein said composition solidifies within less than about 5 minutes to a solid having a density of at least 1 g/cc and a percent elongation of less than 100; and
3. subsequently demolding the resultant article from the mold.

3,983,066

SOLID, RAPID SETTING, RIGID POLYURETHANES

Franciszek Olstowski, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 405,244, Oct. 10, 1973, which is a continuation-in-part of Ser. No. 327,630, Jan. 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 221,784, Jan. 28, 1972, abandoned. This application May 2, 1975, Ser. No. 574,158

Int. Cl.² C08K *5/15*

U.S. Cl. 260—30.4 N **14 Claims**

1. A process for producing solid, rigid, polyurethane articles having a density of at least 1 g/cc, a percent elongation of less than 100, and which can be demolded within a period of about 5 minutes without the addition of an external source of heat, which process comprises

1. admixing, in the absence of a catalytic quantity of a catalyst for urethane formation, the components of a composition comprising
   A. an amine initiated polyol having an OH equivalent weight of from about 50 to less than about 250;
   B. an organic aromatic polyisocyanate;
   C. a liquid modifier having a boiling point above about 150°C selected from organic carbonates and mixtures thereof;

wherein components (A) and (B) are present in quantities such that the NCO:OH ratio is from about 0.8:1 to about 1.5:1 and component (C) is employed in quantities of from about 5% to about 60% by weight of the combined weight of components (A), (B) and (C);

2. placing the admixed composition into a suitable mold wherein said composition soldifies within less than about 5 minutes to a solid having a density of at least 1 g/cc and a percent elongation of less than 100; and
3. subsequently demolding the resultant article from the mold.

3,983,067

DIACETAL DERIVATIVES OF POLYUNSATURATED FATTY ESTERS AS PRIMARY PLASTICIZERS FOR POLYVINYLCHLORIDE

Richard A. Awl, East Peoria, and Everett H. Pryde, Peoria, both of Ill., assignors to The United Sates of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed July 1, 1974, Ser. No. 485,060

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.² C08K *5/10*

U.S. Cl. 260—30.4 R **10 Claims**

4. In a plasticized poly(vinyl chloride) composition an improvement comprising a plasticizing amount of a primary plasticizer selected from the group consisting of methyl di(-dimethyl acetal) stearate, methyl tri(dimethyl acetal) stearate, and mixtures of the same.

3,983,068

SOLID, RAPID-SETTING, RIGID POLYURETHANES

Franciszek Olstowski, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

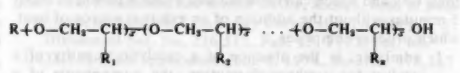
Division of Ser. No. 405,244, Oct. 10, 1973, which is a continuation-in-part of Ser. No. 327,630, Jan. 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 221,784, Jan. 28, 1972, abandoned. This application May 2, 1975, Ser. No. 574,156

Int. Cl.² C08K *5/06*

U.S. Cl. 260—33.2 R **13 Claims**

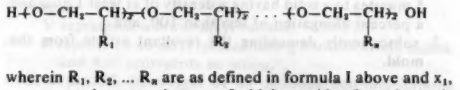
1. A process for producing solid, rigid, polyurethane articles having a density of at least 1 g/cc, a percent elongation of less than 100, and which can be demolded within a period of about 5 minutes without the addition of an external source of heat, which process comprises

1. admixing, in the absence of a catalytic quantity of a catalyst for urethane formation, the components of a composition comprising
   A. an amine initiated polyol having an OH equivalent weight of from about 50 to less than about 250;
   B. an organic aromatic polyisocyanate;
   C. a liquid modifier compound having a boiling point above about 150°C selected from the group consisting of
      1. a liquid partially capped, block or randomly formed polyoxyalkylene compound represented by the general formula



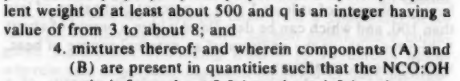
wherein each R is independently selected from saturated and unsaturated hydrocarbon groups having from about 1 to about 6, carbon atoms; R_1, R_2, ... and R_n are independently hydrogen, an aryl group, an alkyl group or haloalkyl group, said alkyl or haloalkyl group having from about 1 to about 2 carbon atoms with the proviso that when R_1, R_2, ... R_n is a haloalkyl group, it is present in a ratio of from about 0 to about 10 percent of the total R_1, R_2, ... R_n groups, and x_1, x_2, ... x_n are integers, the sum of which provides the partially capped polyoxyalkylene compound with a molecular weight of at least about 700;

      2. a liquid, block or randomly formed polyoxyalkylene glycol represented by the general formula



wherein R_1, R_2, ... R_n are as defined in formula I above and x_1, x_2, ... x_n are integers, the sum of which provides the polyoxyalkylene glycol with an equivalent weight of at least about 700;

      3. a liquid, random or block polyoxyalkylene polyol having a hydroxyl functionality of from 3 to about 8 represented by the general formula



wherein R_1, R_2, ... R_n are as defined in formula I above, Z is the residue of an initiator compound having from 3 to about 8 hydroxyl groups, x_1, x_2 ... x_n are integers, the sum of which provides the polyoxyalkylene polyol with a hydroxyl equivalent weight of at least about 500 and q is an integer having a value of from 3 to about 8; and

      4. mixtures thereof; and wherein components (A) and (B) are present in quantities such that the NCO:OH ratio is from about 0.8:1 to about 1.5:1 and component (C) is employed in quantities of from about 5% to about 60% by weight of the combined weight of components (A), (B) and (C);

2. placing the admixed composition into a suitable mold wherein said composition solidifies within less than about 5 minutes to a solid having a density of at least 1 g/cc and a percent elongation of less than 100; and
3. subsequently demolding the resultant article from the mold.

3,983,069

SOLID, RAPID-SETTING, RIGID POLYURETHANES

Franciszek Olstowski, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 405,244, Oct. 10, 1973, which is a continuation-in-part of Ser. No. 327,630, Jan. 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 221,784, Jan. 28, 1972, abandoned. This application May 1, 1975, Ser. No. 573,679

Int. Cl.² C08K *5/02*

U.S. Cl. 260—33.8 UB **13 Claims**

1. A process for producing solid, rigid, polyurethane articles having a density of at least 1 g/cc, a percent elongation of less than 100, and which can be demolded within a period of about 5 minutes without the addition of an external source of heat, which process comprises
   1. admixing, in the absence of a catalytic quantity of a catalyst for urethane formation, the components of a composition comprising
      A. an amine initiated polyol having an OH equivalent weight of from about 50 to less than about 250;
      B. an organic aromatic polyisocyanate;
      C. a liquid modifier having a boiling point above about 150°C selected from chlorinated aliphatic compounds and mixtures thereof; wherein components (A) and (B) are present in quantities such that the NCO:OH ratio is from about 0.8:1 to about 1.5:1 and component (C) is employed in quantities of from about 5% to about 60% by weight of the combined weights of components (A), (B) and (C);
   2. placing the admixed composition into a suitable mold wherein said composition solidifies within less than about 5 minutes to a solid having a density of at least 1 g/cc and a percent elongation of less than 100; and
   3. subsequently demolding the resultant article from the mold.

3,983,070

POLYMERIC ADHESIVE

Richard John Penneck, Lechlade, England, assignor to Raychem Corporation, Menlo Park, Calif.

No Drawing. Continuation-in-part of Ser. No. 273,991, July 21, 1972, abandoned. This application Apr. 24, 1973, Ser. No. 354,128

Claims priority, application United Kingdom, Apr. 28, 1972, 19780/72

Int. Cl.² C08K *9/06*

U.S. Cl. 260—38 **18 Claims**

1. An adhesive comprising:
   a. a polar copolymer of an α-olefin, and
   b. a filler in an amount of up to about 20% by weight based on the total weight of the adhesive, said filler comprising an inorganic silicon compound containing the Si-O-Si group which has been treated with trimethylchlorosilane.

3,983,071

PROCESS OF PREPARING SAND CORES BY USING OXAZOLINE CONDENSATES

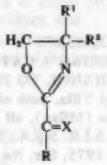
Louis A. Jurisch, Marengo, Ill., assignor to IMC Chemical Group, Inc., Terre Haute, Ind.

Division of Ser. No. 378,366, July 11, 1973, Pat. No. 3,919,135. This application Jan. 2, 1975, Ser. No. 537,869

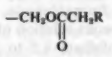
Int. Cl.² C08F *4/28, 26/02*

U.S. Cl. 260—42 **14 Claims**

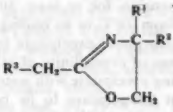
1. A process for preparing a non-polluting sand core for production of metal castings comprising the steps of mixing said sand with an oxazoline in a proportion of about 0.5–5.0% by weight of the sand and a mixture of 3–7% or up to 10% by weight of peroxide alone or in combination with metal driers based on the weight of said oxazoline, and placing the mixture thereby obtained in a mold to harden at ambient temperatures wherein said oxazoline is (a) a mono-oxazoline corresponding to the formula



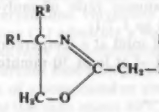
wherein R^1 and R^2 are methyl, ethyl, hydroxymethyl or acyloxymethyl corresponding to the formula



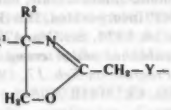
and are the same or different, R is an alkenyl group of from 1 to 18 carbon atoms, and X is H_2, or (b) a bis- or tris-oxazoline corresponding to the formula



where R^3 is the group



wherein X^1 is any divalent or trivalent unsaturated aliphatic hydrocarbon group of from 0 to 32 carbon atoms, and when X^1 is divalent, R^4 is hydrogen and when X^1 is trivalent, R^4 is the group



wherein Y is an unsaturated hydrocarbon of 16 carbon atoms or (c) mixtures thereof.

3,983,072

EXHAUST CATALYST

Ruth E. Stephens, Royal Oak, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Apr. 16, 1973, Ser. No. 351,187
Int. Cl.² B01J 29/12, 29/22, 23/62, 23/82
U.S. Cl. 252—460 8 Claims

1. A catalyst especially adapted for use over an extended period in lowering the hydrocarbon and carbon monoxide content of exhaust gas emitted by an internal combustion engine operating on gasoline containing a tetraalkyl lead antiknock agent, said catalyst consisting essentially of about 0.1–20 weight per cent manganese in an oxide form and 0.005–0.3 weight per cent palladium on a catalyst support.

3,983,073

PROCESS FOR PREPARING A CATALYST FOR THE OXIDATION OF METHANOL TO FORMALDEHYDE

Ferruccio Trifiro; Pierluigi Villa, both of Milan, and Luciano Cairati, Cassano d'Adda (Milan), all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed July 10, 1975, Ser. No. 594,891
Claims priority, application Italy, July 25, 1974, 25545/74
Int. Cl.² B01J 23/88
U.S. Cl. 252—470 14 Claims

1. A method for the preparation of a catalyst active in the oxidation of methanol to formaldehyde, which comprises:

a. slowly mixing an aqueous solution of a soluble molybdate having a pH value of from 1.5 to 5.5 with an aqueous solution of a soluble ferric salt at a temperature of from 20° to 80°C in such proportions as to ensure in the resulting mixture an atomic ratio of molybdenum to iron of at least 1.5:1, thereby to obtain a suspension of an amorphous precipitate;

b. heating said suspension for at least 30 minutes at a temmperature of from 70°C to its boiling point, thereby to transform the amorphous precipitate into iron molybdate having a degree of crystallinity of at least 90%;

c. washing the resulting precipitate with water at a temperature from ambient temperature to its boiling point to remove the soluble salts produced and at least a part of the excess of said soluble molybdate, not transformed into iron molybdate, in order to ensure in the resulting washed solid an atomic ratio of molybdenum to iron ranging from 1.5:1 to 1.7:1;

d. drying said washed solid at a temperature not exceeding 120°C for a period of at least 30 minutes.

3,983,074

CERAMIC BINDER FOR POLYCONDUCTOR POWDERS

David Kahn, and Raymond James Geckle, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed June 14, 1974, Ser. No. 479,242
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976
Int. Cl.² H01B 1/08
U.S. Cl. 252—500 3 Claims

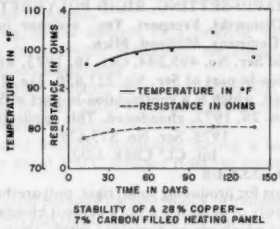
1. As an article of manufacture, a vanadium dioxide or doped vanadium dioxide in a ratio of 5 to 50 percent, and as a binder therewith, vanadium pentoxide and phosphorus pentoxide in admixture from 85% to about 50 percent of vanadium pentoxide on a mole basis, reminder phosphorus pentoxide, said binder intimately and strongly adhering to vanadium dioxide and said binder having voltage threshold for switching which extrapolated to 0 voltage is at approximately 68°C.

3,983,075

COPPER FILLED CONDUCTIVE EPOXY

David W. Marshall, North Reading, and Jagdish Chandra Agarwal, Concord, both of Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Filed June 21, 1974, Ser. No. 481,527
Int. Cl.² H01B 1/02, 1/06
U.S. Cl. 252—511 7 Claims



STABILITY OF A 28% COPPER–7% CARBON FILLED HEATING PANEL

1. An electrically conductive resinous composition consisting essentially of a copper flake the surface of which has been cleaned by removing therefrom impurities and/or oxides, a resinous binder of epoxy resin, an amount of copper flake in said resinous composition being from 25 to 70 percent, the total impurities in said copper flake being less than 7000 ppm, said resinous composition being cured with a curative comprising a polyamide or an anhydride, or mixtures thereof in an amount of about 20 parts to 50 parts of curative to about 80 parts to 50 parts of resin, respectively.

3,983,076

N-TYPE AMORPHOUS SEMICONDUCTOR MATERIALS

Howard K. Rockstad, Troy, and Richard A. Flasck, Pontiac Township, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed July 2, 1973, Ser. No. 375,794
Int. Cl.² H01B 1/06; C03C 3/12, 3/30
U.S. Cl. 252—518 10 Claims

1. An n-type chalcogenide amorphous material as measured by the Seebeck coefficient, said n-type material being that obtained by subjecting a normally p-type amorphous chalcogenide composition to a temperature below its crystallization temperature and which is located at a point on its room temperature versus annealing temperature curve which is sufficiently in excess of the temperature at which its conductivity at room temperature decreases sharply from a relatively high constant value that its Seebeck coefficient has a negative value, and then cooling the same to room temperature.

3,983,077

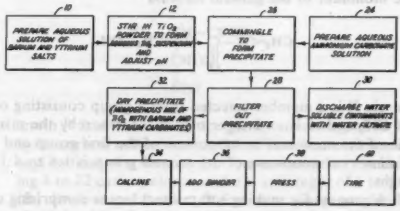
PROCESS FOR MAKING CERAMIC RESISTOR MATERIALS

Peter G. Fuller, Lakeville, Mass., and Hans A. Stoeckler, Woonsocket, R.I., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 2, 1975, Ser. No. 574,768
Int. Cl.² H01B 1/08
U.S. Cl. 252—520 14 Claims

1. A method for producing a mixed metal oxide material incorporating at least one element selected from the group consisting of barium, strontium, calcium and lead and at least one metal selected from the group consisting of titanium, tin and zirconium, said method comprising the steps of combining

an aqueous solution of a water soluble compound of at least said one element with an oxide of at least said one metal suspended in an aqueous medium and regulating the pH of said combined solution-suspension to obtain desired stability thereof, thereby to place any water soluble contaminants of



said compound in metal oxide in solution in said aqueous medium, removing said aqueous medium with said contaminants to leave a homogeneous mixture of a material incorporating said one element and said metal oxide, and pyrolyzing said mixture for forming said mixed metal oxide material.

3,983,078

OIL REMOVAL DETERGENT COMPOSITIONS

Jerome H. Collins, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 406,413, Oct. 15, 1973, abandoned. This application June 23, 1975, Ser. No. 589,117

Claims priority, application Canada, Oct. 7, 1974, 210835

Int. Cl.[2] C11D *1/72, 1/83, 3/075, 3/12*

U.S. Cl. 252—540 **1 Claim**

1. A spray dried granular detergent composition containing: (1) About 20% of a sodium alkyl benzene sulfonate wherein said alkyl group contains an average of 12 carbon atoms; (2) About 5% of a mixture of (a) an ethoxylated primary oxo alcohol having an average molecular weight of 160 and a range of chain lengths between 9 and 11 carbon atoms with a major proportion containing 10 carbon atoms, said alcohol being ethoxylated with about four moles of ethylene oxide per mole of alcohol and (b) an ethoxylated secondary alcohol containing from 11 to 13 carbon atoms with an average chain length of 12 carbon atoms, said alcohol being ethoxylated with 9 moles of ethylene oxide per mole of alcohol; (3) About 33% sodium tripolyphosphate; (4) about 2% sodium toluene sulfonate; (5) About 0.6% sodium carboxymethyl cellulose; (6) About 21.9% sodium sulfate; (7) about 2.5% bentonite clay; (8) About 5.4% of sodium silicate having an SiO_2 :Na_2O ratio of 2, and (9) the balance water.

3,983,079

DISHWASHING COMPOSITION

Gianfranco Luigi Spadini, Strombeek-Bever, and Emiel Mathilde Anna Alfons Demessemaekers, Heverlee, both of Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 29, 1974, Ser. No. 501,531

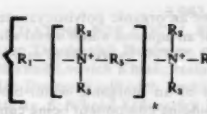
Claims priority, application Luxemburg, Sept. 4, 1973, 68355

Int. Cl.[2] C11D *1/62, 1/65*

U.S. Cl. 252—545 **8 Claims**

1. A dishwashing detergent composition especially adapted for washing and imparting shine to glassware, china and articles with vitreous surfaces, comprising:

A. from about 1 to about 5 percent by weight of the total composition of a water-soluble quaternary ammonium compounds of the general formula:



wherein R_1 and R_4 are each alkyl radicals having from 12 to 16 carbon atoms;

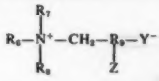
R_2 and R_3 are each radicals selected from the group consisting of methyl, ethyl, and hydroxyethyl;

R_5 is a radical selected from the group consisting of ethylene, propylene and hydroxypropylene;

X^- is an anion selected from the group consisting of chloride and bromide or mixtures thereof; and k is 0;

B. from about 4 to about 20 percent by weight of a nonionic surface-active polypropylene oxide-polyethylene oxide condensation product having a molecular weight of from 500 to about 10,000, wherein the ethylene oxide content is from about 10 to about 30 percent by weight of said condensation product; and

C. from about 5 to about 20 percent by weight of a water-soluble compound of the general formula:



wherein R_6 is a radical selected from the group consisting of alkyl radicals having from 12 to 16 carbon atoms;

R_7 and R_8 are each radicals selected from the group consisting of methyl, ethyl, and hydroxyethyl;

Y^- is $-SO_3$; and R_9-Z is a $-CH(OH)-CH_2-$ radical,

whereby the weight ratio of (A)/(B) is from about 1:4 to about 1:10, and the weight ratio of (A)/(C) is from about 1:5 to about 1:20.

3,983,080

EXTRUSION FOAMING OF NORMALLY CRYSTALLINE VINYLIDENE CHLORIDE POLYMERS

Kyung W. Suh; Richard E. Skochdopole, and Malcolm E. Leduc, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sept. 20, 1974, Ser. No. 508,024

Int. Cl.[2] C08J *9/18*

U.S. Cl. 260—2.5 B **4 Claims**

1. A process for forming stable low density extruded foam from normally crystalline vinylidene chloride polymer such process comprising (1) admixing a normally crystalline vinylidene chloride polymer in comminuted form with from about 5 to about 25 percent based on polymer weight of a blowing agent composed of a compound or compound mixture having a boiling point of less than about 40°C, a vapor pressure at the foaming temperature used of greater than atmospheric pressure but less than about 1000 p.s.i. and a solubility parameter of greater than about 6.6 and less than about 8.7, then (2) extrusion foaming the admixture using an extrusion temperature of from about 120°C to about 150°C.

3,983,081

INORGANIC-ORGANIC COMPOSITION

Dieter Dieterich, and Peter Markusch, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 27, 1974, Ser. No. 446,577

Claims priority, application Germany, Feb. 2, 1973, 2310559

Int. Cl.[2] C08G *18/14;* **C08K** *3/34, 5/51*

U.S. Cl. 260—2.5 AJ **28 Claims**

1. An inorganic-organic composition obtained by reacting a mixture of:

A. from 5-98% by weight of an organic polyisocyanate,

B. from 95-2% by weight of an aqueous alkali metal silicate solution containing about 20-70% by weight of said alkali metal silicate,

C. from 0-93% by weight of an inorganic water-binding component, said water-binding component being capable of absorbing water to form a solid or a gel, and based on the total weight of components (A), (B) and (C),

D. from 1-30% by weight of a halogen or phosphorus containing compound,

with the proviso that when component (C), is from 0-20% by weight, component (A) contains 2-200 milliequivalents of ionic groups or groups capable of forming ionic groups in the presence of alkali metal silicates per 100 grams of said organic isocyanate, and wherein said composition is a solid/solid xerosol.

6. The composition of claim 1, wherein an inert liquid boiling at temperatures of −25°C to +50°C is included in the reaction mixture as a blowing agent in a quantity of up to 50% by weight, and the reaction mixture is allowed to react to completion while foaming.

3,983,082

INTUMESCENT FIRE RETARDANT MATERIAL AND ARTICLE

Richard D. Pratt, Cincinnati; Paul F. Proffitt, Reading, and George Webb, Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Feb. 19, 1975, Ser. No. 550,933

Int. Cl.² C08K *3/04*, *3/10*

U.S. Cl. 260—2.5 S 3 Claims

1. An improved silicone base intumescent fire retardant material comprising a mixture of:

35 – 75 parts by weight of a silicone resin; and

22 – 112 parts by weight of the mixture of ingredients comprising, by weight:

1 – 10 parts of an oxide of iron;

17 – 52 parts of a phosphate of potassium;

2 – 30 parts of a charring material; and

2 – 20 parts of a blowing agent.

3,983,083

SOFT CONTACT LENSES AND PROCESS FOR PREPARATION THEREOF

Isao Kaetsu; Minoru Kumakura; Akihiko Ito, all of Takasaki, and Yuji Maeda, Tokyo, all of Japan, assignors to Japan Atomic Energy Research Institute and Tokyo Optical Company Ltd. (Kabushiki Kaisha Tokyo Megane), both of Tokyo, Japan

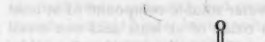
Filed Dec. 6, 1974, Ser. No. 530,119

Claims priority, application Japan, Dec. 11, 1973, 48-137380

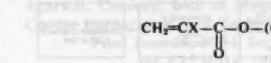
Int. Cl.² B29D *11/00*; C08G *2/00*; C08F *218/00*, *216/02*

U.S. Cl. 526—240 6 Claims

1. Soft contact lenses consisting essentially of copolymer derived from a monomer mixture of at least one polymerizable monomer of the general formula,



wherein X is a member selected from a group consisting of H and CH_3 and n is either of 2 or 3 and at least one polymerizable monomer of the general formula



wherein X is a member selected from a group consisting of H and CH_3 and m is an integer of 4 to 13, whereby the mixing ratio of the monomer or monomers of the first group and the monomer or monomers of the second group is 1:6 to 4:1 by weight.

5. A process for making soft contact lenses comprising cast polymerizing a monomer mixture as defined in claim 1, cooling the resulting copolymer body to a temperature not higher than 0°C, at which it stands in a rigid state, and shaping said body into the lens form in the cooled rigid state.

3,983,084

ART OF MANUFACTURING COMPRESSION MOLDED PARTICLE BOARD WITH NITROGENOUS MODIFIED AMYLACEOUS BINDER

Richard J. Alexander, Wauwatosa, and Robert K. Krueger, Sheboygan, both of Wis., assignors to Krause Milling Company, Milwaukee, Wis.

Filed Oct. 18, 1974, Ser. No. 516,055

Int. Cl.² C08L *3/00*

U.S. Cl. 260—17.2 18 Claims

1. A method of manufacturing particle board comprising the following steps:

a. Preparing an amylaceous binder by combining a nitrogen compound with a gelatinized cereal grain or an amylaceous fraction thereof using water in an amount less than 20 percent of the total mix, and heating the mixture to bring the temperature to between 75° C and 180° C while the gelatinized material and nitrogen compound are both present, the nitrogen compound being in the amount of 3–20 percent based on the weight of the cereal grain and being of the family containing the chemical grouping

$$>N(R_1R_2N)C{:}X$$

where X is O, S or NH and where R_1 is H or CH_3 and where R_2 is H or CH_3;

b. intimately mixing a resin selected from the group of urea-formaldehyde, melamine-formaldehyde and phenol-formaldehyde resins or mixture thereof with the amylaceous binder to produce a resin-binder mixture which is composed of from 5–50 percent of the amylaceous binder and of 50–95 percent of the resin;

c. blending a quantity of the resin-binder mixture with wood particles, with said quantity being 5–20 percent of the weight of the wood particles;

d. subjecting the blend of resin-binder mixture and wood particles to heat and pressure.

3,983,085

STABILIZED HALOGEN-CONTAINING RESIN COMPOSITIONS

Ryonosuke Yoshida, Kamakura, and Kazutami Sakamoto, Kawasaki, both of Japan, assignors to Ajinomoto Co., Inc., Kyoba, Japan

Filed July 15, 1975, Ser. No. 596,153

Claims priority, application Japan, July 24, 1974, 49-84726; Apr. 21, 1975, 50-48387

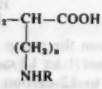
Int. Cl.² C08J *3/20*

U.S. Cl. 260—23 XA 7 Claims

1. A halogen-containing resin composition comprising a halogen containing resin selected from the group consisting of

polyvinyl chloride, polyvinylidene chloride, a copolymer of vinyl chloride and vinylidene chloride with copolymerizable unsaturated monomers, chlorinated polyethylene and chlorinated polypropylene and one or more of stabilizers selected from the group consisting of

1. a chelate compound of (A) an N_{ω} -substituted basic amino acid having the general formula



wherein R is selected from the group consisting of an alkyl hydrocarbon radical having 8 to 22 carbon atoms and an acyl radical of a saturated or unsaturated fatty acid having 8 to 22 carbon atoms, and *n* is an integer of 1 to 4 with (B) divalent metal selected from the group consisting of alkaline earth metals and zinc, and

2. a mixture of (A) a basic amino acid derivative selected from the group consisting of a salt of a basic amino acid selected from the group consisting of α,β diaminopropionic acid, α,γ-diaminobutyric acid, ornithine and lysine with a saturated or unsaturated fatty acid having 8 to 22 carbon atoms and an N_{ω} -substituted basic amino acid defined by the above general formula and (B) a divalent metal compound selected from the group consisting of alkaline earth metal compounds and zinc compounds, said divalent compound being an oxide, hydroxide, or carbonate and the proportion of (A) to (B) being substantially stoichimetrical; wherein the amount of stabilizer is 0.5 to 5 parts by weight per 100 parts by weight of said halogen-containing resin.

3,983,086

SMOKE RETARDANT VINYL CHLORIDE AND VINYLIDENE CHLORIDE POLYMER COMPOSITIONS

Elmer D. Dickens, Jr., Richfield, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 30, 1974, Ser. No. 537,434

Int. Cl.² C08L *91/00*

U.S. Cl. 260—23 XA **18 Claims**

1. A smoke retardant composition comprising a vinyl chloride or vinylidene chloride polymer together with (A) at least one nickel compound selected from the group consisting of $NiCO_3$, $NiCrO_4$, NiI_2, NiO, NiS, $NiSO_4$, nickel acetylacetonate, nickel citrate and nickel formate and (B) at least one iron compound selected from the group consisting of Fe_3C, $Fe_2(MoO_4)_3$, Fe_2O_3, Fe_3O_4, FeS, cyclopentadienyl iron dicarbonyl, ferric acetylacetonate, ferric hydroxy distearate and dicyclopentadienyl iron, said compounds (A) and (B) being present in a total amount from about 0.25 to about 20 weight parts per 100 weight parts of polymer.

3,983,087

NOVEL PROCESS OF RECLAIMING POLYURETHANE FOAM

Benjamin Tucker, Bethany, and Henri Ulrich, Northford, both of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 464,856, April 29, 1974, abandoned. This application July 25, 1975, Ser. No. 598,751

Int. Cl.² C08J *11/04*

U.S. Cl. 260—2.3 **4 Claims**

1. A process for converting scrap flexible polyurethane foam, which foam has been derived from a polyether polyol, to a homogeneous mixture of polyols, which process comprises heating, at a temperature in the range of 180°C to 250°C, a mixture of (a) said scrap flexible foam and (b) 1,2-propylene glycol said glycol being present in an amount by weight which does not exceed the total weight of said scrap foam.

3,983,088

COATING FOR LOCAL PROTECTION OF PARTS

Viktor Timofeevich Pozdneev, ulitsa Textilschikov, 4, kv. 87; Mikhail Lvovich Khina, Malaya Kalitnikovskaya, ul., 5, kv. 48; Dmitry Vasilievich Bashkirov, ul. Tatyany Makarovoi, 10, kv. 5; Nikolai Fedorovich Judin, Sevastopolsky prospekt, 14, kv. 223, and Nikolai Sergeevich Kobzev, Volzhsky bulvar, 20, kv. 90, all of Moscow, U.S.S.R.

Filed June 22, 1972, Ser. No. 265,182

Claims priority, application U.S.S.R., June 22, 1971, 1672186

Int. Cl.² C08L *93/00*

U.S. Cl. 260—24 **2 Claims**

1. A coating for local protection of parts against saturation with carbon and nitrogen during chemical heat treatment of said parts, containing (in weight per cent):

boric anhydride	15–30,
silicon carbide	15–35,
epoxy resin	1–10,
rosin	25–50,
benzene	the rest.

3,983,089

NOVEL 1-ARYL-2-ARYLALKYL-3-OR-4-[4'-(SUBSTITUTED-ALKYL)-PIPERAZINO-1']-BUTANOLS-2 OR-BUTENES-1, AND METHODS OF MANUFACTURE THEREOF

Wolf-Dieter Vigelius, Denzlingen, and Spyridon Marinis, Emmendingen, both of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 398,513, Sept. 18, 1973, Pat. No. 3,947,411. This application Aug. 25, 1975, Ser. No. 607,846

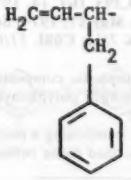
Claims priority, application Germany, Sept. 21, 1972, 2246279

Int. Cl.² C07D *403/06*

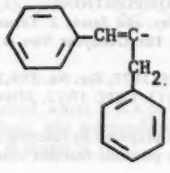
U.S. Cl. 260—240 K **3 Claims**

1. A compound of the formula:

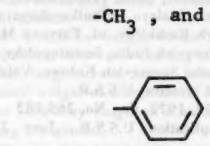
wherein A is selected from the group consisting of:



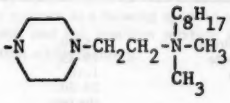
, and

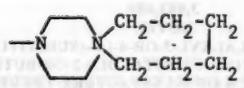


wherein B is selected from the group consisting of:



wherein D is selected from the group consisting of:





3,983,090

COMPOSITION OF A POLYPHENYLENE ETHER AND STYRENE RESIN AND AN ACRYLIC RESIN IN COMBINATION WITH A DIENE RUBBER-CONTAINER RESIN

Visvaldis Abolins, Delmar, and Donald L. Reinhard, Albany, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 189,393, Oct. 14, 1971, Pat. No. 3,833,688. This application May 17, 1974, Ser. No. 471,159
Int. Cl.² C08K 7/14; C08L 51/04
U.S. Cl. 260—42.18 32 Claims

1. A normally rigid thermoplastic composition comprising
a. a composition comprising a polyphenylene ether resin and a styrene resin and
b. a resinous composition comprising a polymerized acrylic monomer and a polymerized diene rubber.

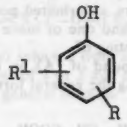
3,983,091

PHENOLIC ANTIOXIDANTS PREPARED FROM TRICYCLOPENTADIENE AND STABILIZED COMPOSITIONS

Richard H. Gloth, Copley, and James J. Tazuma, Stow, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed July 25, 1975, Ser. No. 599,212
Int. Cl.² C08K 5/13; C07C 37/12, 37/00, 39/18
U.S. Cl. 260—45.95 H 5 Claims

1. A reaction product prepared by reacting a mixture comprising (A) at least one phenolic reactant conforming to the following structural formula



wherein R is selected from the group consisting of hydrogen, alkyl radicals having from 1 to 12 carbon atoms, cycloalkyl radicals having from 5 to 12 carbon atoms, aralkyl radicals having from 7 to 12 carbon atoms, substituted and unsubstituted aryl radicals having 6 to 12 carbon atoms, alkoxy radicals having from 1 to 12 carbon atoms, cycloalkoxy radicals having from 5 to 12 carbon atoms and aralkoxy radicals having from 7 to 12 carbon atoms and R^1 is selected from the group consisting of hydrogen and tertiary alkyl radicals having from 4 to 12 carbon atoms and (B) tricyclopentadiene, in the presence of a Friedel-Crafts catalyst, at a temperature of from 25° C. to 160° C. the molar ratio of the tricyclopentadiene compound to the phenolic reactant being from 1:1 to 1:10.

4. A polymer subject to oxidation having incorporated therein the reaction product of claim 1.

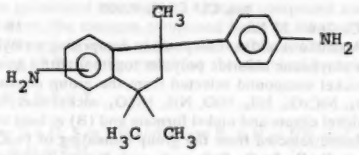
3,983,092

PHENYLINDANE DIAMINE MIXTURE AND EPOXY RESIN THEREWITH

John Bateman, Bardonia, and David A. Gordon, Scarsdale, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 20, 1975, Ser. No. 542,144
Int. Cl.² B01J 31/02; C08G 39/12; C07C 87/64
U.S. Cl. 260—47 EN 3 Claims

1. A phenylindane diamine mixture having the formula



said mixture comprising 15 to 50% 5-amino-1-(4'-aminophenyl)-1,3,3-trimethylindane and 85 to 50% 6-amino-1-(4'-aminophenyl)-1,3,3-trimethylindane.

3. A composition of matter which is comprised of (a) an epoxy resin and (b) the phenylindane diamine mixture of claim 1.

3,983,093

NOVEL POLYETHERIMIDES

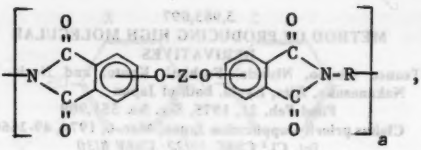
Frank J. Williams, III, Scotia, and Paul E. Donahue, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 19, 1975, Ser. No. 578,601
Int. Cl.² C08G 73/10
U.S. Cl. 260—47 CP 12 Claims

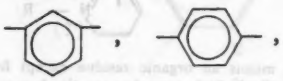
1. A polyetherimide of the formula

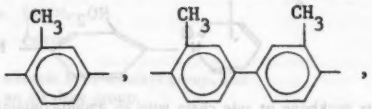
$$[A]_m\,[B]_{1-m},$$

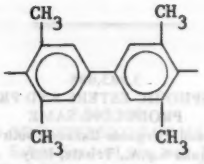
where the m is a number greater than 0 and smaller than 1, where A units are of the formula:

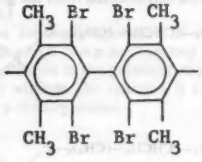


where —O—Z—O— is in the 3 or 3′- and 4 or 4′-positions and Z is a member of the class consisting of (1)

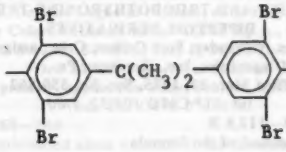




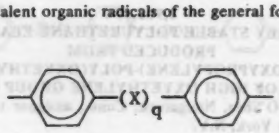




and

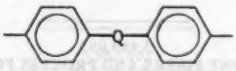


and (2) divalent organic radicals of the general formula:



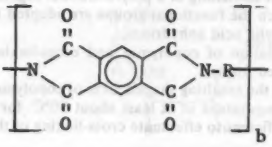
where X is a member selected from the class consisting of divalent radicals of the formulas, $-C_yH_{2y}-$,

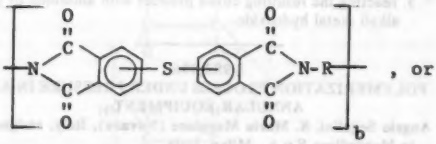
—O— and —S—, where q is 0 or 1, y is a whole number from 1 to 5, R is a divalent organic radical selected from the class consisting of (a) aromatic hydrocarbon radicals having from 6–20 carbon atoms and halogenated derivatives thereof, (b) alkylene radicals and cycloalkylene radicals having from 2–20 carbon atoms, $C_{(2-8)}$ alkylene terminated polydiorganosiloxane, and (c) divalent radicals included by the formula

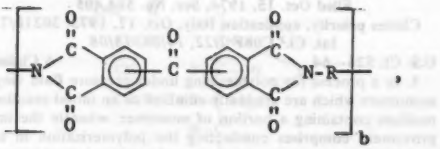


where Q is a member selected from the class consisting of —O—,

—S—, and $-C_xH_{2x}-$, and x is a whole number from 1 to 5 inclusive, and where the B units are of the formulas:







or mixtures thereof, where R is a divalent organic radical as previously defined, and independently a and b represent a whole number in excess of 1.

3,983,094

THERMALLY STABLE POLYURETHANE ELASTOMERS PRODUCED FROM POLY(OXYPROPYLENE)-POLY(OXYETHYLENE)-GLYCOLS OF HIGH OXYETHYLENE GROUP CONTENT

Francis X. O'Shea, Naugatuck, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Filed Sept. 11, 1975, Ser. No. 612,420
Int. Cl.² B62D 29/04; C08G 18/32
U.S. Cl. 260—77.5 AM 3 Claims

1. A thermally stable polyurethane elastomer which is a reaction product of: (a) a poly(oxypropylene)-poly(oxyethylene) glycol of molecular weight from about 1750 to about 4000 and containing 15 to 50% by weight oxyethylene groups; (b) methylenebis(4-phenylisocyanate); and (c) 1,4-butanediol; the NCO/OH equivalents ratio being from 0.95 to 1.2 and the molar ratio of (c) to (a) being from 3/1 to 12/1, said elastomer having a hardness of about 40 to 55 Shore D, an elongation of greater than 270%, an ultimate tensile strength of at least 2700 psi and a Die C tear strength of at least 500 pli, said elastomer displaying improved thermal stability as evidenced by its ability to retain at least twice as much of its original tensile strength, after exposure to a temperature of 415°F. for 20 minutes, as an otherwise similar elastomer in which (a) contains 10% or less oxyethylene groups.

3,983,095

ABSORBENT FIBERS AND PROCESS FOR THEIR PREPARATION

Robert Niles Bashaw, and Bobby Leroy Atkins, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 12, 1973, Ser. No. 331,849
Int. Cl.² C08F 8/44
U.S. Cl. 526—15 19 Claims

1. A method for the preparation of water-insoluble, water-swellable polymer products which comprises the steps of

1. forming a solution, in an organic solvent, of a copolymer of maleic anhydride with a vinyl monomer copolymerizable therewith,
2. adding to said solution from about 0.25 to 2.5 percent by weight, based on the weight of copolymer present, of a cross-linking agent consisting of a polyfunctional organic compound in which the functional groups are adapted to react with carboxylic acid anhydrides,
3. extruding the solution of copolymer and cross-linking agent into a shaped form,
4. drying and curing the resulting shaped form of copolymer at an elevated temperature of at least about 50°C. for a period of time sufficient to effectuate cross-linking of the copolymer, and
5. reacting the resulting cured product with ammonia or an alkali metal hydroxide.

3,983,096

POLYMERIZATION PROCESS UNDER PRESSURE IN AN ANNULAR EQUIPMENT

Angelo Segalini, S. Maria Maggiore (Novara), Italy, assignor to Montedison S.p.A., Milan, Italy

Filed Oct. 15, 1974, Ser. No. 514,405
Claims priority, application Italy, Oct. 17, 1973, 30210/73
Int. Cl.² C08F 2/22, 14/06, 18/08
U.S. Cl. 526—64 6 Claims

1. In a process for polymerizing under pressure fluid vinyl monomers which are gradually admixed to an initial reaction medium containing a portion of monomer, wherein the improvement comprises conducting the polymerization in an annular reactor including bottom and top legs joined by two vertical legs and having a height to width ratio greater than 1, a circulating pump in said bottom leg, the vertical leg into which said pump discharges having a volume of between about 5 and 30 percent of the reactor total volume.

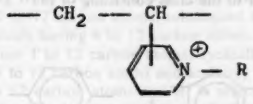
3,983,097

METHOD OF PRODUCING HIGH MOLECULAR DERIVATIVES

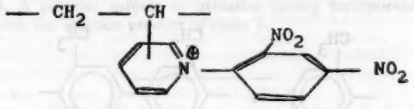
Tsuneo Okubo, Nishide, Fushimi, Kyoto, and Norio Ise, Nakanosaka, Kita, Kyoto, both of Japan

Filed Feb. 21, 1975, Ser. No. 551,909
Claims priority, application Japan, Mar. 6, 1974, 49-26605
Int. Cl.² C08C 19/22; C08F 8/30
U.S. Cl. 526—49 3 Claims

1. A method for producing high molecular weight derivatives containing at least a recurring unit of the formula:



wherein R means an organic residue except for 2,4-dinitrophenyl radical which comprises reacting homopolymers or copolymers of vinyl pyridine including at least a structural unit



in its backbone or side chain with an amino-containing organic compounds represented by the general formula: RNH_2 wherein R has the meaning defined above in the presence of a liquid reaction medium under neutral to alkaline conditions.

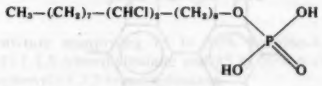
3,983,098

ORTHOPHOSPHORIC ESTERS AND PROCESS FOR PRODUCING SAME

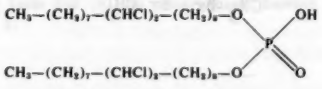
Giancarlo Bussi, and Pierpaolo Baradel, both of Trieste, Italy, assignors to Aquila S.p.A., Trieste, Italy

Filed Oct. 18, 1974, Ser. No. 516,029
Claims priority, application Italy, Oct. 18, 1973, 30279/73
Int. Cl.² C07F 9/09; C10M 1/44
U.S. Cl. 260—963 4 Claims

1. A water soluble salt selected from the group consisting of



and



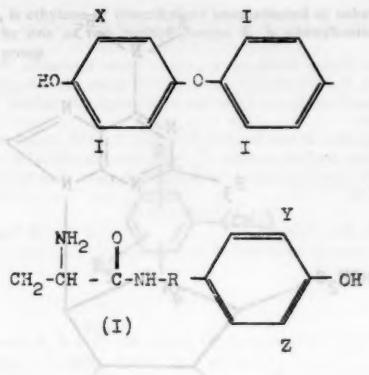
3,983,099

THYROXINE-AND TRIIODOTHYRONINE-TYROSINE DIPEPTIDE DERIVATIVES

Gordon Dean Niswender, Fort Collins, Colo., assignor to Micromedic Diagonistics, Inc., Horsham, Pa.

Filed Mar. 19, 1975, Ser. No. 559,862
Int. Cl.² C07G 103/52, 7/00
U.S. Cl. 260—112.5 R 9 Claims

1. A compound of the formula



wherein
X is H, I, ^{125}I, or ^{131}I,
R is a group selected from the group consisting of

a. $\begin{matrix}CHCH_3-\\ COOR^\circ\end{matrix}$

wherein R° is an alkyl group, and
b. an alkylene group,
Y is H; ^{125}I, or ^{131}I, and
Z is H; ^{125}I, or ^{131}I.

3,983,100

PREPARATION OF SUSPENSIONS OF MALEAMIC ACIDS

Maurice Balme, Sainte-Foy-les-Lyon, and Max Gruffaz, La Mulatiere, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Feb. 4, 1975, Ser. No. 546,925
Claims priority, application France, Feb. 7, 1974, 74.04128
Int. Cl.² C07C *103/64, 105/00*
U.S. Cl. 260—143 **11 Claims**

1. In a process for the preparation of a suspension of a bis-maleamic acid which comprises reacting maleic anhydride with a diprimary diamine in the presence of an organic diluent the improvement wherein the reaction is carried out in the presence also of a tertiary amine.

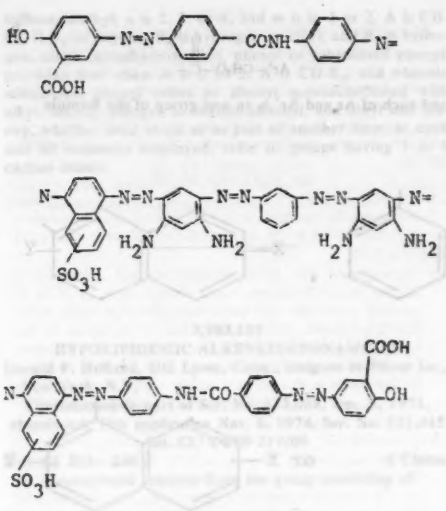
3,983,101

WATER-SOLUBLE POLYAZO COMPOUND DERIVED FROM 4-4-DIAMINOBENZANILIDE

Sisto Sergio Papa; Antonino Condò, both of Milan, and Renzo Ferrario, Ceriano Laghetto (Milan), all of Italy, assignors to Aziende Colori Nazionali Affini ACNA S.p.A., Milan, Italy

Division of Ser. No. 547,171, Feb. 5, 1975. This application Oct. 28, 1975, Ser. No. 625,908
Claims priority, application Italy, Feb. 11, 1974, 20381/74
Int. Cl.² C09B *35/50*
U.S. Cl. 260—144 **1 Claim**

1. A sulphonated azoic dyestuff of the formula:



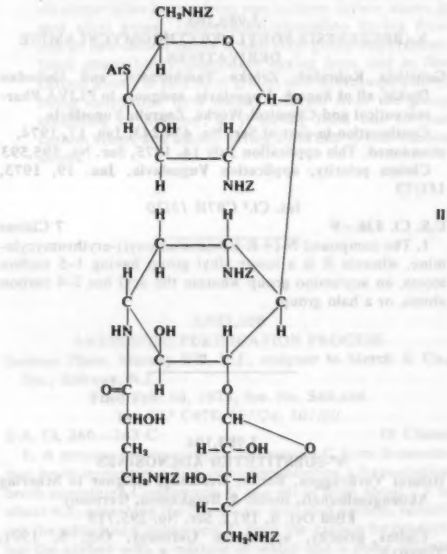
3,983,102

PROCESS FOR PREPARING 5''-AMINO-4',5''-DIDEOXYBUTIROSIN A

Peter Wing Kee Woo, and Theodore Herbert Haskell, both of Ann Arbor, Mich., assignors to Parke, Davis & Company, Detroit, Mich.

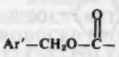
Filed Apr. 17, 1975, Ser. No. 569,128
Int. Cl.² C07H *15/22*
U.S. Cl. 536—17 **4 Claims**

1. Process for the production of 5''-amino-4',5''-dideoxybutirosin A which comprises reducing a compound of the formula

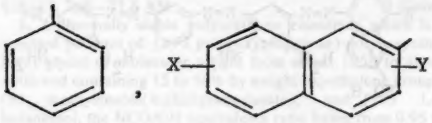


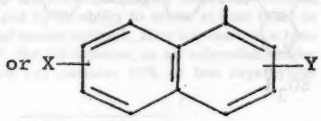
II

with a reducing agent which is either molecular hydrogen in the presence of a noble metal catalyst or sodium in liquid ammonia, wherein Z is a protective group of the formula



and each of Ar and Ar' is an aryl group of the formula





wherein each of X and Y is hydrogen, halogen, nitro, lower alkyl of from one to four carbon atoms or lower alkoxy of one to four carbon atoms; and isolating the product as the free base or after treatment of the product with an acid as an acid-addition salt thereof.

3,983,103
N-(BENZENESULFONYL)-ERYTHROMYCYLAMINE DERIVATIVES

Gabrijela Kobrehel; Zrinka Tamburašev, and Slobodan Djokić, all of Zagreb, Yugoslavia, assignors to PLIVA Pharmaceutical and Chemical Works, Zagreb, Yugoslavia

Continuation-in-part of Ser. No. 434,243, Jan. 17, 1974, abandoned. This application July 14, 1975, Ser. No. 595,593

Claims priority, application Yugoslavia, Jan. 19, 1973, 151/73

Int. Cl.² C07H *15/20*

U.S. Cl. 536—9 **7 Claims**

1. The compound N-(4-R-benzenesulfonyl)-erythromycylamine, wherein R is a lower alkyl group having 1–5 carbon atoms, an acylamino group wherein the acyl has 2–4 carbon atoms, or a halo group.

3,983,104
N⁶-SUBSTITUTED ADENOSINES

Helmut Vorbruggen, Berlin, Germany, assignor to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

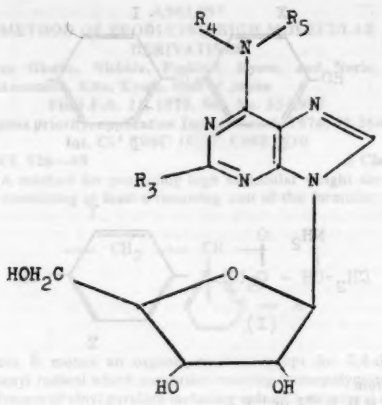
Filed Oct. 6, 1972, Ser. No. 295,719

Claims priority, application Germany, Oct. 8, 1971, 2151013

Int. Cl.² C07H *19/16*

U.S. Cl. 536—24 **10 Claims**

6. A compound of the formula



wherein

R_3 represents hydrogen or amino, and

R_4 and R_5, together with the N-atom, collectively represent a heteromonocyclic ring of 5–7 members containing a further oxygen- or nitrogen atom, the nitrogen atom being unsubstituted or substituted by a methyl group.

3,983,105
PENICILLINS

Hans-Bodo Konig; Wilfried Schrock, and Karl Georg Metzger, all of Wuppertal-Elberfeld, Germany, assignors to Bayer Aktiengesellschaft, Germany

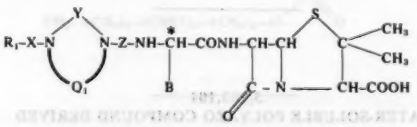
Continuation-in-part of Ser. No. 299,246, Oct. 20, 1972, abandoned, and a continuation-in-part of Ser. No. 300,776, Oct. 20, 1972, abandoned. This application Sept. 3, 1974, Ser. No. 502,662

Claims priority, application Germany, Oct. 23, 1971, 2152967; Oct. 23, 1971, 2152968

Int. Cl.² C07D *499/46*

U.S. Cl. 260—239.1 **33 Claims**

1. A compound selected from the group consisting of a penicillin of the formula



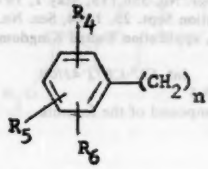
wherein the carbon atom designated by * constitutes a center of chirality;

X is —CO—, —CS— or —SO_2—;

each of Y and Z, independently of the other, is —CO— or —CS—;

B is thienyl, cyclohexenyl, cyclohexa-1,4-dien-1-yl, phenyl or phenyl substituted by one or two members selected from the group consisting of halo nitro, hydroxy, methoxy, methylthio and alkyl of 1 to 5 carbon atoms;

Q_1 is ethylene or trimethylene unsubstituted or substituted by one or two methyl groups; R_1 is phenylamino; the group



in which n is 0, 1 or 2 and each of R_4, R_5 and R_6, independently of the others, is hydrogen, nitro, cyano, halo, trifluoromethyl, R, $(R)_2N$, $(R)_2NCO-$, RCONH—, ROCO, RCOO or RO where R is alkyl of 1 to 5 carbon atoms; or when X is other than $-SO_2-$, phenoxy; and the pharmaceutically acceptable salts thereof.

3,983,106

5-HETEROCYCLICALKYL-2-ARYL-3-HALO 1,5-BENZOTHIAZEPIN-4(5H)-ONES

John Krapcho, Somerset, and Chester F. Turk, Kendall Park, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

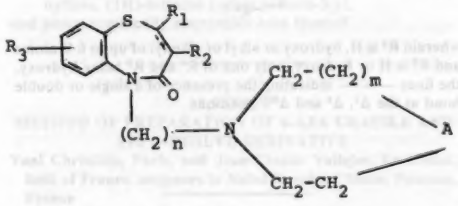
Filed July 3, 1975, Ser. No. 592,966

The portion of the term of this patent subsequent to July 15, 1992, has been disclaimed.

Int. Cl.² C07D *281/02*

U.S. Cl. 260—239.3 B **10 Claims**

1. A compound having the formula



or a pharmaceutically acceptable salt thereof, or a quaternary ammonium salt thereof formed with an alkyl halide, a benzyl halide, or a dialkyl sulfate, or a 1-oxide or 1,1-dioxide derivative thereof; wherein R_1 is phenyl or substituted phenyl; R_2 is chlorine or bromine; R_3 is hydrogen, alkyl, alkoxy, halogen, or trifluoromethyl; n is 2, 3, or 4; and m is 0, 1 or 2, A is CH-R_4, N-R_5 or oxygen, R_4 is hydrogen or alkyl, and R_5 is hydrogen, alkyl, monohydroxyalkyl, phenyl or substituted phenyl, provided that when m is 0 or 2, A is CH-R_4; and wherein substituted phenyl refers to phenyl monosubstituted with alkyl, alkoxy, halogen or trifluoromethyl, and alkyl and alkoxy, whether used alone or as part of another term, in each and all instances employed, refer to groups having 1 to 6 carbon atoms.

3,983,107

HYPOLIPIDEMIC ALKENESULFONAMIDES

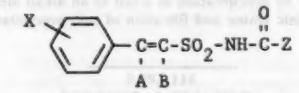
Gerald F. Holland, Old Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 422,088, Dec. 5, 1973, abandoned. This application Nov. 6, 1974, Ser. No. 521,445

Int. Cl.² C07D *211/06*

U.S. Cl. 260—240 J **6 Claims**

1. A compound selected from the group consisting of



and the salts thereof;

wherein

X is selected from the group consisting of hydrogen, chloro and methyl;

A and B are each selected from the group consisting of hydrogen, methyl and ethyl;

and Z is selected from the group consisting of 4-methoxypiperidino, 4-carboxypiperidino, 4-phenylpiperidino, alkylpiperidino having from one to three carbon atoms in said alkyl group, (phenylalkyl)piperidino having from one to five carbon atoms in said alkyl group and ([substituted phenyl]-alkyl)piperidino having from one to five carbon atoms in said alkyl group, said substituted phenyl being substituted by a moiety selected from the group consisting of hydroxy, alkyl having from one to four carbon atoms and alkoxy having from one to four carbon atoms.

3,983,108

ANTIBIOTIC PURIFICATION PROCESS

Seemon Pines, Murray Hill, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 10, 1975, Ser. No. 548,466

Int. Cl.² C07D *501/24, 501/60*

U.S. Cl. 260—243 C **10 Claims**

1. A process for separating Cephamycin C from fermentation broth impurities which comprises filtering a fermentation broth containing Cephamycin C at a pH of from about 2.5 to about 4.5, adsorbing the filtrate on activated carbon, removing the adsorbed Cephamycin C from the carbon by contacting the carbon with a mixture of water and a polar organic solvent, contacting the desorbed filtrate with an anion exchange resin, and eluting the resin with a salt solution at a pH of from about 5.5 to about 10.

3,983,109

PROCESS FOR RECOVERING CEPHALOSPORIN C FROM A FERMENTATION BROTH AS THE N-(p-NITROBENZOYL) DERIVATIVE

Ernesto Oppici, and Anacleto Gianantonio, both of Milan, Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

Filed Dec. 30, 1974, Ser. No. 537,487

Claims priority, application United Kingdom, Jan. 3, 1974, 207/74

Int. Cl.² C07D *501/12*

U.S. Cl. 260—243 C 6 Claims

1. A process for the high recovery yield of cephalosporin C from a fermentation broth thereof characterized in that cephalosporin C is

a. transformed into its N-(p-nitrobenzoyl) derivative by mixing its fermentation broth diluted with ca. 5 to 15 percent by volume of a water-miscible or partially water-miscible organic solvent with about 1.5 to about 10 molecular proportions of p-nitrobenzoyl chloride per molecular proportion of cephalosporin C in the presence of a hydrochloric acid acceptor and at a pH of about 6.5 to about 8 and a temperature of about 5° to 10°C, then adjusting the pH to 4.5 to 5,

b. extracting said derivative from the reaction mixture with a water-immiscible organic solvent to eliminate impurities and recovering it as a high purity crystalline product by concentration and filtration of the resultant precipitates or by precipitation as a salt of an alkali metal or of an organic amine and filtration of said precipitate.

3,983,110

SUBSTITUTED BENZOPYRANOPYRIDINE

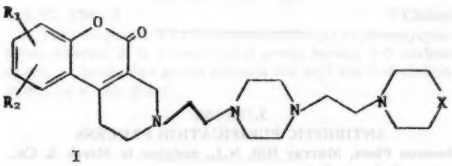
Richard E. Brown, East Hanover; Chester Puchalski, Dover, and John Shavel, Jr., Mendham, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 534,502, Dec. 19, 1974, Pat. No. 3,946,008, which is a continuation-in-part of Ser. No. 343,613, March 21, 1973, abandoned, which is a continuation-in-part of Ser. No. 122,498, March 9, 1972, abandoned. This application July 25, 1975, Ser. No. 599,290

Int. Cl.² C07D *491/04*

U.S. Cl. 260—247.2 B 4 Claims

1. A benzopyranopyridine of the general formula:



I

wherein R_1 and R_2 may be hydrogen, hydroxy, lower alkoxy or lower alkyl of 1 to 6 carbon atoms or may be taken together to form a methylenedioxy group; X may be oxygen, sulfur, CH_2CH_2, a bond connecting the adjacent carbon atoms, CH—R_3 or N—R_3 wherein R_3 may be hydrogen or lower alkyl of 1 to 6 carbon atoms; or the hydrochloride salts thereof.

3,983,111

STEROIDAL ANAESTHETICS OF THE PREGNANE AND 19-NORPREGNANE SERIES

Gordon Hanley Phillipps, Wembley; Robin Lawrence, Stoke Poges, and Christopher Earle Newall, Acton, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

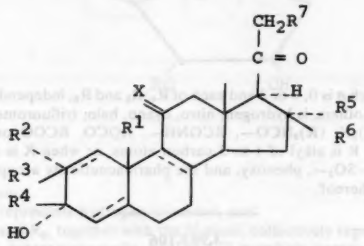
Continuation of Ser. No. 356,115, May 1, 1973, abandoned. This application Sept. 23, 1974, Ser. No. 508,650

Claims priority, application United Kingdom, May 5, 1972, 21214/72

Int. Cl.² C07J *41/00*

U.S. Cl. 260—239.5 28 Claims

1. A steroid compound of the formula



or a pharmaceutically acceptable salt thereof wherein R^1 is —H or $—CH_3$;

R^2 is H, C_1–C_6 alkyl or a halogen atom;

R^3 is H, acyloxy or acylthio of 1–9 C atoms, an ether or thioeter group of 1–9 C atoms, an alkyl or cycloalkyl group of up to 9 C atoms, phenyl, benzyl, hydroxy, thiocyanato, nitrooxy, a halogen atom, azido, amino, monoalkylamino, dialkylamino or morpholino;

R^4 is H or C_1–C_6 alkyl;

R^5 and R^6 are each H, C_1–C_6 alkyl, C_1–C_6 alkoxy or a halogen atom, only one of R^5 and R^6 being a halogen atom;

R^7 is cyano, azido or substituted or unsubstituted morpholino, thiamorpholino, pyrrolino, pyrrolidino, piperidino or thiazolidino; and

X is oxo, an epoxy group linked also to the 9-position or a grouping

wherein R^8 is H, hydroxy or alkyl or alkenyl of up to 6 C atoms and R^9 is H or hydroxy, only one of R^8 and R^9 being hydroxy, the lines — — — indicating the presence of a single or double bond at the Δ^1, Δ^4 and $\Delta^{8(9)}$ positions.

3,983,112

17β-ETHYNYL-3,17α-ESTRADIOL AND DERIVATIVES THEREOF

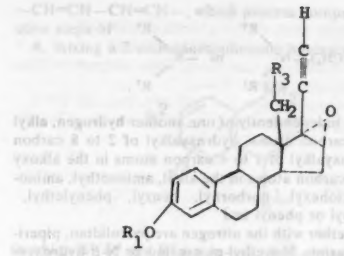
Ramesh Maganlal Kanojia, Somerville, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Sept. 4, 1973, Ser. No. 393,873

Int. Cl.² C07J *1/00*

U.S. Cl. 260—239.55 R 7 Claims

1. A compound of the formula:



wherein R_1 is hydrogen, lower alkyl, cycloalkyl or lower acyl having 2–6 carbon atoms; R_3 is hydrogen.

3,983,113

CEPHALOSPORIN TYPE ANTIBACTERIALS

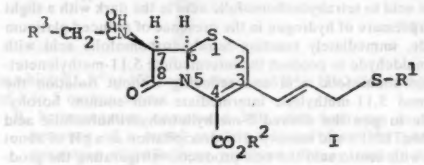
Philip J. Beeby, Mountain View, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 605,109, Aug. 15, 1975. This application Oct. 14, 1975, Ser. No. 621,717

Int. Cl.² C07D *501/14*

U.S. Cl. 260—240 R **52 Claims**

1. A compound selected from the group having the formula:



wherein

the propenyl double bond is trans;

R^1 is 1-methyltetrazol-5-yl; or 1,2,4-triazol-5-yl;

R^2 is hydrogen, diphenylmethyl, p-methoxybenzyl, p-nitrobenzyl, o-nitrobenzyl, benzyl, t-butyl, 2,2,2-trichloroethyl, phenacyl or pivaloyloxymethyl;

R^3 is thiophen-2-yl; trifluormethylthio, phenoxy, phenylthio, (1H)-tetrazol-1-yl or sydnon-3-yl;

and pharmaceutically acceptable salts thereof.

3,983,114

METHOD OF PREPARATION OF 6-AZA URACILE AND ITS O-DISILYL DERIVATIVE

Yani Christidis, Paris, and Jean-Claude Vallejos, La Ciotat, both of France, assignors to Nobel Hoechst Chimie, Puteaux, France

Filed Oct. 24, 1975, Ser. No. 625,839

Claims priority, application France, Nov. 5, 1974, 74.36754

Int. Cl.² C07D *253/06*

U.S. Cl. 260—248 AS **9 Claims**

1. A method of preparation of 6-aza uracile, comprising the steps of:

a. Cyclization of semi-carbazone of glyoxylic acid by heating this latter with an excess of a trialkyl-silylation agent taken as a solvent and isolating the resulting product, namely the O-disilylated derivative of 6-aza uracile (or di-3,5 (trialkylsiloxy)1,2,4 triazine) and

b. subjection of the product resulting from step a) to an acid hydrolysis.

3,983,115

BIS-DIHALOGENO-S-TRIAZINYL UREAS

Karl Seitz, Oberwil; Rainer Begrich, Basel; Henri Riat, Arlesheim, and Fritz Oesterlein, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

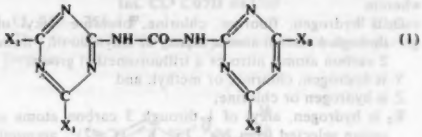
Filed Dec. 24, 1974, Ser. No. 536,131

Claims priority, application Switzerland, Jan. 9, 1974, 239/74

Int. Cl.² C07D *251/44*

U.S. Cl. 260—249.5 **5 Claims**

1. Bis-dihalogeno-s-triazinyl-urea of the formula



(1)

wherein each of X_1 and X_2 is halogen.

3,983,116

HERBICIDAL TRIAZINES

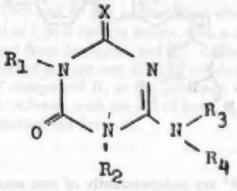
Kang Lin, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 348,321, April 5, 1973, abandoned, which is a continuation-in-part of Ser. No. 256,249, May 24, 1972, abandoned. This application June 5, 1974, Ser. No. 476,553

Int. Cl.² C07D *251/46*

U.S. Cl. 260—249.5 **11 Claims**

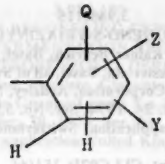
1. A compound of the formula:



wherein

R_1 is selected from alkyl of 2 through 8 carbon atoms, alkenyl of 3 through 6 carbon atoms, alkynyl of 3 through through 6 carbon atoms, cycloalkyl of 4 through 8 carbon atoms, cycloalkenyl of 5 through 8 carbon atoms, cycloalkylmethyl of 4 through 9 carbon atoms, cycloalkenylmethyl of 6 through 9 carbon atoms, bicycloalkyl or bicycloalkenyl of 7 through 10 carbon atoms and bicycloalkylmethyl or bicycloalkenylmethyl of 8 through 11 carbon atoms, trimethylcyclohexyl and tetramethylcyclohexyl; the above alkyl groups substituted with one methoxy, ethoxy, methylthio or ethylthio group; the above cycloalkyl groups substituted with one alkyl of 2 through 4 carbon atoms, 1 through 2 methyl groups, 1 through 2 chlorines or bromines, one methoxy or one ethoxy group;

and



wherein

Q is hydrogen, fluorine, chlorine, bromine, alkyl of 1 through 4 carbon atoms, alkoxy or alkylthio of 1 through 2 carbon atoms, nitro or a trifluoromethyl group;

Y is hydrogen, chlorine, or methyl; and

Z is hydrogen or chlorine;

R_2 is hydrogen, alkyl of 1 through 3 carbon atoms or a cation selected from Na^+, Li^+, K^+, $(Ca/2)^+$, ammonium and dimethylammonium;

R_3 is hydrogen, methyl or ethyl;

R_4 is alkyl of 1 through 4 carbon atoms, alkenyl of 3 through 4 carbon atoms, alkynyl of 3 through 4 carbon atoms, or methoxy; and

X is oxygen or sulfur;

provided that when X is sulfur, neither R_2 nor R_3 is hydrogen.

3,983,117
6-TRIAZINYLAMINOBENZOFURANS

Horst Scheuermann, Ludwigshafen, and Wolfgang Mach, Hockenheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

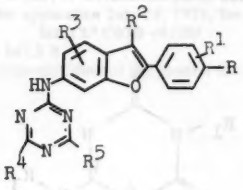
Filed June 24, 1974, Ser. No. 482,252

Claims priority, application Germany, June 27, 1973, 2332597

Int. Cl.² C07D 251/52

U.S. Cl. 260—249.8 **5 Claims**

1. A 6-N-triazinylamino-benzofuran of the formula

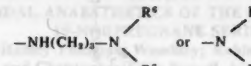


wherein:

R, R^1 and R^3 are independently of one another hydrogen, chlorine, bromine, cyano, carboxyl, hydroxysulfonyl, phenylsulfony, methyl, ethyl, methoxy, ethoxy, alkoxycarbonyl or alkoxyethoxycarbonyl of 1 to 4 carbon atoms in the alkoxy, methylsulfonyl, ethylsulfonyl, alkoxysulfonyl of 1 to 4 carbon atoms in the alkoxy, carbamoyl or sulfamoyl substituted on nitrogen once or twice by alkyl of 1 to 4 carbon atoms, hydroxyalkyl of 2 or 3 carbon atoms, cyclohexyl, benzyl, phenylethyl or phenyl; carbo-pyrrolidide, carbo-piperidide, carbo-piperazide, carbo-N-methyl-piperazide, carbo-N-β-hydroxyethylpiperazide, sulfo-pyrrolidide, sulfopiperidide, sulfo-piperazide, sulfo-N-methyl-piperazide or sulfo-N-β-hydroxyethylpiperazide;

R^2 is hydrogen, methyl, ethyl or phenyl;

R^4 and R^5 are independently of one another hydrogen, alkyl of 1 to 4 carbon atoms, cyclohexyl, benzyl, phenylethyl, phenylpropyl, phenyl, chlorine, bromine, hydroxy, alkoxy of 1 to 8 carbon atoms, phenoxy, methylmercapto, ethylmercapto, phenylmercapto,



R^6 and R^7 are independently of one another hydrogen, alkyl of 1 to 8 carbon atoms, hydroxyalkyl of 2 to 8 carbon atoms, alkoxyalkyl of 1 to 4 carbon atoms in the alkoxy and 2 or 3 carbon atoms in the alkyl, aminoethyl, aminohexyl, cyclohexyl, norbornyl, benzyl, phenylethyl, phenylpropyl or phenyl and

R^6 and R^7 together with the nitrogen are pyrrolidino, piperidino, piperazino, N-methyl-piperazino or N-β-hydroxyethylpiperazino.

3,983,118
PRODUCTION OF N⁵-METHYLTETRAHYDROHOMOFOLIC ACID AND RELATED REDUCED DERIVATIVES OF HOMOFOLIC ACID

Roger L. Knott; Alison Taunton-Rigby, both of Waltham, Mass., and John A. R. Mead, Bethesda, Md., assignors to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Continuation-in-part of Ser. No. 263,559, June 16, 1976, Pat. No. 3,870,719. This application Aug. 16, 1974, Ser. No. 498,187

Int. Cl.² C07D 475/04

U.S. Cl. 260—251.5 **1 Claim**

1. In the preparation of N⁵-methyltetrahydrohomofolic acid from homofolic acid, the steps consisting of reducing homofolic acid to tetrahydrohomofolic acid in the dark with a slight overpressure of hydrogen in the presence of reduced platinum oxide, immediately reacting tetrahydrohomofolic acid with formaldehyde to product the intermediate 5,11-methylenetetrahydrohomofolic acid and reducing without isolation the formed 5,11-methylene intermediate with sodium borohydride to give the desired 5-methyltetrahydrohomofolic acid (5-MeTHHF) and removing by precipitation at a pH of about 3.8 with acetic acid the side products, refrigerating the product filtrate containing 5-MeTHHF overnight and separating and recovering 5-MeTHHF.

3,983,119
PROCESS FOR THE PREPARATION OF OPTIONALLY SUBSTITUTED 1,2,3,5-TETRAHYDROIMIDAZO[2,1-b]QUINAZOLIN-2-ONES

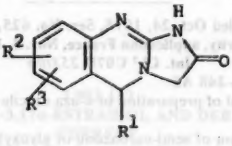
Warren Neil Beverung, Jr., Minoa; Richard Anthony Partyka, and Thomas Andrew Jenks, both of Liverpool, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Nov. 6, 1974, Ser. No. 521,304

Int. Cl.² C07D 187/04

U.S. Cl. 260—256.4 F **4 Claims**

1. The process for the preparation of the compound having the formula

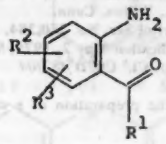


I

in which R^1 is (lower)alkyl, R^2 and R^3 are alike or different and each is hydrogen, chloro, bromo, fluoro, SO_3H, (lower)alkyl, hydroxy, nitro, amino, (lower)alkoxy or phenyl, or when taken together R^2 and R^3 are methylenedioxy or the moiety

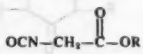
—CH=CH—CH=CH—; which process comprises the consecutive steps of

A. mixing a 2-aminoacetophenone having the formula



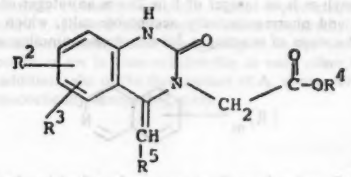
XI

in which R^1, R^2 and R^3 are as described above, with a (lower-)alkyl isocyanatoacetate having the formula



XII

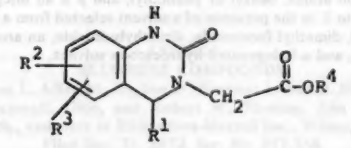
in which R^4 is (lower)alkyl of 1 to 6 carbon atoms, in a molar ratio of at least one mole of compound XI per mole of compound XI, with the aid of heat in the presence of a reaction inert organic solvent, to produce the compound having the formula



XIII

in which R^2, R^3 and R^4 are as above and R^5 is H or (lower)alkyl of 1 to 5 carbon atoms;

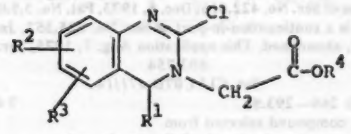
B. hydrogenating compound XIII with hydrogen in the presence of a metal catalyst selected from the group consisting of palladium, platinum, Raney nickel, rhodium, ruthenium, nickel and palladium on charcoal, in a (lower)alkanol or water-(lower)alkanol solvent system to produce the compound having the formula



XIV

in which R^1, R^2, R^3 and R^4 are as above;

C. halogenating compound XIV with a halogenating agent selected from the group consisting of phosphorous oxychloride, $POBr_3$, phosphorous pentachloride and thionyl chloride, in a ratio of at least one mole of halogenating agent per mole of compound XIV, in the presence of a reaction inert organic solvent if needed, to produce the compound having the formula



XV

in which R^1, R^2, R^3 and R^4 are as above; and

D. treating compound XV with a large excess of ammonia, with the aid of heat, to produce the compound of formula I.

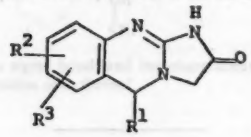
3,983,120

PROCESS FOR THE PREPARATION OF OPTIONALLY SUBSTITUTED 1,2,3,5-TETRAHYDROIMIDAZO[2,1-b] QUINAZOLIN-2-ONES

Warren Neil Beverung, Minoa, and Richard Anthony Partyka, Liverpool, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Nov. 6, 1974, Ser. No. 521,305
Int. Cl.² C07D *487/04*
U.S. Cl. 260—256.4 F **4 Claims**

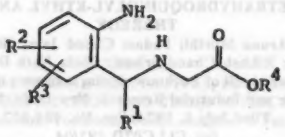
1. The process for the preparation of a compound having the formula



I

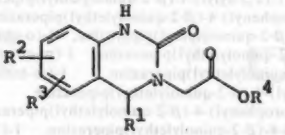
in which R^1 is H or (lower)alkyl, R^2 and R^3 are alike or different and are hydrogen, chloro, bromo, fluoro, (lower)alkyl, hydroxy, nitro, SO_3H, amino, (lower)alkoxy or phenyl, or when taken together R^2 and R^3 are methylenedioxy or the moiety —CH=CH—CH=CH— ; which process comprises the consecutive steps of

A. mixing a compound having the formula



II

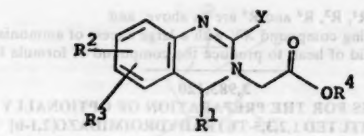
in which R^1, R^2 and R^3 are as described above and R^4 is (lower)alkyl of 1 to 6 carbon atoms, with a condensation agent selected from phosgene and 1,1'-carbonyl diimidazole, in a ratio of at least one mole of condensation agent per mole of compound II, in the presence of a reaction inert organic solvent, with the aid of heat, to produce the compound having the formula



III

in which R^1, R^2, R^3 and R^4 are as above,

B. treating compound III with at least one mole of $POCl_3$, $SOCl_2$, $POBr_3$ or tri(lower)alkoxonium tetrafluoroborate to produce the compound having the formula



IVa

in R^1, R^2, R^3 and R^4 are as above and Y is Cl, Br, or (lower)alkoxy; and

C. treating compound IV*a* with a large excess of ammonia dissolved in a (lower)alkanol selected from the group consisting of methanol, ethanol, n-propanol and isopropanol with the aid of heat, to produce compound I.

3,983,121

1-SUBSTITUTED 4-(β-2-QUINOLYLETHYL)PIPERAZINES AND 1,2,3,4-TETRAHYDROQUINOLYL-ETHYL ANALOGUES THEREOF

Varanasi Aruna Murthi; Padam Chand Jain; Jitendra Nath Sharma; Rikhab Chand Srimal; Bhola Nath Dhawan, and Nitya Anand, all of Lucknow, India, assignors to Council of Scientific and Industrial Research, New Delhi, India

Filed July 1, 1974, Ser. No. 484,527

Int. Cl.² C07D *295/04*

U.S. Cl. 260—268 BQ **28 Claims**

1. A compound which is a member of the group consisting of:

1-(m-tolyl)-4-(β-2-quinolylethyl)piperazine, 1-(m-tolyl)-4-(β-2-quinolylethyl)piperazine hydrochloride, 1-(m-tolyl)-4-[β-2-(1,2,3,4-tetrahydroquinolyl)ethyl]piperazine, 1-(m-tolyl)-4-[β-2-(1,2,3,4-tetrahydroquinolyl)-ethyl]piperazine hydrochloride, 1-(o-tolyl)-4-(β-2-quinolylethyl)piperazine, 1-(p-tolyl)-4-(β-2-quinolylethyl)piperazine, 1-phenyl-4-(β-2-quinolylethyl)piperazine, 1-(p-methoxyphenyl)-4-(β-2-quinolylethyl)piperazine, 1-(o-methoxyphenyl)-4-(β-2-quinolylethyl)piperazine, 1-(2,5-xylyl)-4-(β-2-quinolylethyl)piperazine, 1-(p-chlorophenyl)-4-(β-2-quinolylethyl)piperazine, 1-methyl-4-(β-2-quinolylethyl)piperazine, 1-(o-chlorophenyl)-4-(β-2-quinolylethyl)piperazine, 1-(m-chlorophenyl)-4-(β-2-quinolylethyl)piperazine, 1-(m-trifluoromethylphenyl)-4-(β-2-quinolylethyl)piperazine, 1-(3,4-dichlorophenyl)-4-(β-2-quinolylethyl)piperazine, 1-(2,4-xylyl)-4-(β-2-quinolylethyl)piperazine, 1-(3,4-xylyl)-4-(β-2-quinolylethyl)piperazine, 1-(β-phenethyl)-4-(β-2-quinolylethyl)piperazine, 1-(o-fluorophenyl)-4-(β-2-quinolylethyl)piperazine, 1-(m-fluorophenyl)-4-(β-2-quinolylethyl)piperazine, 1-(p-fluorophenyl)-4-(β-2-quinolylethyl)piperazine, 1-benzyl-4-(β-2-quinolylethyl)-piperazine, 1-(m-tolyl)-4-[β-2-(1,2,3,4-tetrahydroquinolylethyl)]piperazine, 1-(o-tolyl)-4-[β-2-(1,2,3,4-tetrahydroquinolylethyl)]piperazine, 1-(p-tolyl)-4-[β-2-(1,2,3,4-tetrahydroquinolylethyl)]piperazine and 1-(p-methoxyphenyl)-4-[β-2-(1,2,3,4-tetrahydroquinolylethyl)]piperazine.

3,983,122

PROCESS FOR THE PREPARATION OF QUINOLIZINONE DERIVATIVES

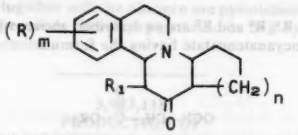
Charles Andrew Lundberg, Cincinnati, Ohio, assignor to Richardson-Merrell Inc., Wilton, Conn.

Continuation-in-part of Ser. No. 350,384, Dec. 23, 1974, abandoned. This application May 2, 1975, Ser. No. 574,100

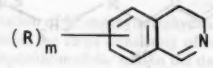
Int. Cl.² C07D *487/04*

U.S. Cl. 260—289 AZ **10 Claims**

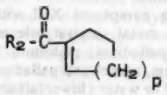
1. A process for the preparation of a compound of the formula



wherein R is selected from hydrogen, hydroxy, halogen, trifluoromethyl, a straight or branched lower alkyl group of from 1 to 6 carbon atoms, and a straight or branched lower alkoxy group of from 1 to 6 carbon atoms; R_1 is selected from hydrogen, a lower alkyl group of from 1 to 6 carbon atoms, phenyl, and benzyl; *m* is an integer of 1 or 2; *n* is an integer of from 1 to 3; and pharmaceutically acceptable salts, which comprises the steps of reacting a 3,4-dihydroisoquinoline of the formula



wherein R and *m* have the meanings described hereinabove, with a cycloalk-1-enyl ketone of the formula:



wherein R_2 is selected from a lower alkyl group of from 1 to 7 carbon atoms, benzyl or phenethyl; and *p* is an integer of from 1 to 3, in the presence of a solvent selected from a lower alcohol, dimethyl formamide, dimethylsulfoxide, an aromatic solvent, and a halogenated hydrocarbon solvent.

3,983,123

TRANS-OCTAHYDROPYRIDOINDOLOBENZAZEPINES

Charles De Witt Adams, Wilmington, Del., assignor to Endo Laboratories, Inc., Garden City, N.Y.

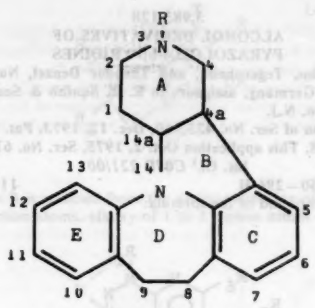
Division of Ser. No. 422,616, Dec. 6, 1973, Pat. No. 3,932,650, which is a continuation-in-part of Ser. No. 325,352, Jan. 22, 1973, abandoned. This application Aug. 7, 1975, Ser. No. 602,754

Int. Cl.² C07D *471/14*

U.S. Cl. 260—293.55 **7 Claims**

1. A compound selected from

A. free amines having the following formula



wherein

R is benzyl; benzyl ring-substituted with methyl, methoxy or chloro; phenethyl; 3-phenylpropyl; 3-phenylpropyl ring substituted with chloro, bromo or methoxy; furfuryl; 2-thenyl; C_1–C_5 alkyl; cyclopropyl; C_4–C_8 cycloalkylmethyl; (methylcyclopropyl)methyl; exo-7-norcarylmethyl; (4-methylbicyclo[2.2.2]oct-1-yl)methyl; (bicyclo[2.2.1]hept-2-yl)methyl; 1-adamantylmethyl or 2-adamantylmethyl; and the hydrogens in the 4a and 14a positions are in trans relationship to each other; and

B. addition salts of the free amines of A, above, with pharmaceutically acceptable acids.

3,983,124

FLUORENE COMPOUNDS

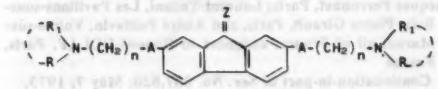
William L. Albrecht; Stephen W. Horgan; Arthur D. Sill, all of Cincinnati, Ohio, and Robert W. Fleming, Ann Arbor, Mich., assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed Dec. 21, 1972, Ser. No. 317,238

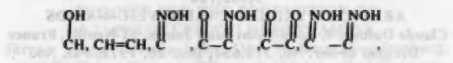
Int. Cl.[2] C07D *295/12*

U.S. Cl. 260—293.62 7 Claims

1. A 2,7-bis-basic fluorene having the formula:



wherein A is selected from the group consisting of CH_2,



and a sigma bond; *n* is an integer of from 1 to 4; R and R_1 are each selected from the group consisting of lower alkyl having from 1 to 6 carbon atoms, cycloalkyl having from 3 to 6 carbon atoms, alkenyl having from 3 to 6 carbon atoms in which the unsaturation is in a position other than the 1-position of the alkenyl group, and when R and R_1 are taken together with the nitrogen atom to which they are attached they represent the pyrrolidinyl, piperidino or the morpholino radical; Z is selected from the group consisting of H_2, O, and H(OH) with the proviso that when Z is H(OH), the symbol A can only represent CH_2,

CH=CH or a sigma bond; and the pharmaceutically acceptable acid addition salts thereof.

3,983,125

THIENO-PYRIDINE DERIVATIVES, PROCESS FOR THEIR PREPARATION AND THEIR APPLICATIONS

Armand Amselem, Toulouse, France, assignor to Parcor, Paris, France

Filed July 3, 1975, Ser. No. 593,051

Claims priority, application France, July 16, 1974, 74.24631; June 5, 1975, 75.17552

Int. Cl.[2] C07D *213/28*

U.S. Cl. 260—294.8 C 10 Claims

1. Compound selected from the compounds of the formula

in which R is selected from the group consisting of hydrogen and the alkyl groups having 1–6 carbon atoms, and their therapeutically administrable acid addition salts.

3,983,126

ARYLOXY PYRIDINE CARBOXYLIC-4-ACIDS

Claude Dufour, 4, Rond-Point Saint James, 92-Neuilly, France

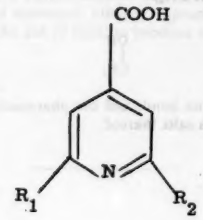
Division of Ser. No. 318,651, Dec. 26, 1972, Pat. No. 3,822,278, which is a continuation-in-part of Ser. No. 238,963, March 28, 1972, Pat. No. 3,822,277, which is a continuation of Ser. No. 807,395, March 14, 1969, abandoned. This application Apr. 23, 1974, Ser. No. 463,419

Claims priority, application France, Dec. 24, 1971, 71.46688

Int. Cl.² C07D *213/02*

U.S. Cl. 260—295 R 3 Claims

1. A compound of the formula:



wherein R_1 is a chloro, bromo, or fluoro and R_2 is an aryloxy group of 6 nuclear carbon atoms which may be substituted with at least one lower alkyl group or halogen group.

3,983,127

PYRROLO[3,4-b]PYRIDINES

Giorgio Tarzia, Rome, and Gianbattista Panzone, Cornaredo (Milan), both of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

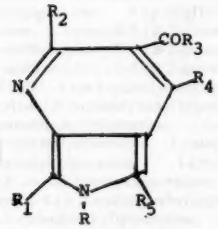
Filed Mar. 17, 1975, Ser. No. 559,092

Claims priority, application United Kingdom, Mar. 20, 1974, 12386/74

Int. Cl.² C07D *471/04*

U.S. Cl. 260—295.5 B 2 Claims

1. A compound of the formula



wherein

R represents hydrogen, (C_{1-4})alkyl, benzyl or chloro-substituted benzyl;

R_1 represents hydrogen, (C_{1-4})alkyl, phenyl or methyl-substituted phenyl;

R_2 and R_4 independently represent (C_{1-4})alkyl, phenyl or hydroxy;

R_3 represents (C_{1-4})alkyl or (C_{1-4})alkoxy;

R_5 represents (C_{1-4})alkyl; and a salt thereof with a pharmaceutically-acceptable acid.

3,983,128

ALCOHOL DERIVATIVES OF PYRAZOLO[3,4-b]PYRIDINES

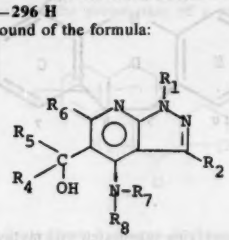
Hans Hoehn, Tegernheim, and Theodor Denzel, Nurnberg, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 423,960, Dec. 12, 1973, Pat. No. 3,928,368. This application Oct. 2, 1975, Ser. No. 618,871

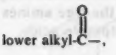
Int. Cl.² C07D *221/00*

U.S. Cl. 260—296 H 11 Claims

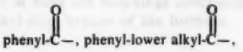
1. A compound of the formula:



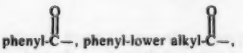
wherein R_1 is selected from the group consisting of hydrogen, lower alkyl, phenyl, phenyl-lower alkyl, and cycloalkyl of 3 to 7 carbon atoms; and R_2 is selected from the group consisting of hydrogen, lower alkyl, and phenyl; R_7 and R_8 are each independently selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, cycloalkyl of 3 to 7 carbon atoms,



phenyl, phenyl-lower alkyl



di-lower alkylamino-lower alkyl, lower alkyl-sulfonyl, phenyl-sulfonyl, and mono and disubstituted phenyl, phenyl-lower alkyl,



and phenyl-sulfonyl wherein said phenyl substituents are selected from the group consisting of halogen, lower alkyl, trifluoromethyl, amino and carboxy; and R_4 and R_5 are independently selected from the group consisting of hydrogen, lower alkyl, phenyl, mono and disubstituted phenyl wherein said phenyl substituents are as set forth above, phenyl-lower alkyl, and cycloalkyl of 3 to 7 carbon atoms; and R_6 is selected from the group consisting of hydrogen, lower alkyl, and phenyl; and their pharmaceutically acceptable salts.

3,983,129

CERTAIN ISOTHIAZOLOL ESTERS OF PHOSPHORUS ACIDS

Jacques Perronnet, Paris; Laurent Taliani, Les Pavillons-sous-Bois; Pierre Girault, Paris, and André Poittevin, Vaires-sur-Marne, all of France, assignors to Roussel-UCLAF, Paris, France

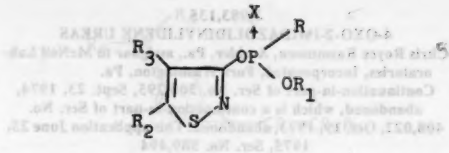
Continuation-in-part of Ser. No. 357,820, May 7, 1973, abandoned. This application Jan. 13, 1975, Ser. No. 540,381

Claims priority, application France, Oct. 11, 1974, 74.34267; May 17, 1972, 72.17578

Int. Cl.² C07D *261/12*

U.S. Cl. 260—302 E 13 Claims

1. A compound of the formula



wherein R is selected from the group consisting of alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms and

R′ and R″ being individually selected from the group consisting of hydrogen and alkyl of 1 to 3 carbon atoms, R_1 is alkyl of 1 to 3 carbon atoms, R_2 is selected from the group consisting of hydrogen, alkyl of 1 to 5 carbon atoms, aryl of 6 to 10 carbon atoms, aralkyl of 7 to 12 carbon atoms, cyano, carbalkoxy of 2 to 4 carbon atoms and NHR‴, R‴ is selected from the group consisting of hydrogen and aryl of 6 to 10 carbon atoms, R_3 is selected from the group consisting of cyano, alkylthio of 1 to 4 carbon atoms, alkylsulfinyl of 1 to 4 carbon atoms, alkylsulfonyl of 1 to 4 carbon atoms, carbamoyl, carbalkoxy of 2 to 4 carbon atoms and

A and B are individually selected from the group consisting of hydrogen and alkyl of 1 to 3 carbon atoms and X is selected from the group consisting of oxygen and sulfur.

3,983,130

ANTHELMINTIC ISOTHIOCYANOBENZOXAZOLES

Venkatachala Lakshmi Narayanan, Hightstown, and Rudiger D. Haugwitz, Titusville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

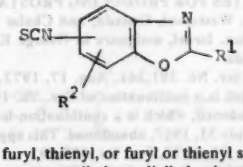
Continuation of Ser. No. 259,057, June 2, 1972, abandoned. This application July 8, 1974, Ser. No. 486,280

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.² C07D *263/56*

U.S. Cl. 260—307 D 10 Claims

1. A compound of the structure



wherein R^1 is furyl, thienyl, or furyl or thienyl substituted with alkyl, halogen, acetoxyalkyl, or dialkylaminoalkyl, and R^2 is selected from the group consisting of hydrogen, alkyl, halogen, and alkoxy; wherein the terms alkyl and alkoxy refer to groups having up to 7 carbon atoms; and a physiologically acceptable acid-addition salt thereof.

3,983,131

PROCESS FOR THE PRODUCTION OF 1,1′-PEROXYDICYCLOHEXYLAMINE

Jürgen Tröger, Grossauheim; Otto Weiberg, Neu-Isenburg, and Wolfgang Weigert, Offenbach (Main), all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

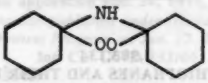
Filed Jan. 20, 1971, Ser. No. 108,195

Claims priority, application Germany, Jan. 26, 1970, 2003269; Jan. 31, 1970, 2004440

Int. Cl.² C07D *273/00*

U.S. Cl. 260—307 FB 5 Claims

1. In a process for the production of 1,1′-peroxydicyclohexylamine having the formula



by reacting cyclohexanone, hydrogen peroxide and ammonia, the improvement consisting essentially of carrying out the reaction in the absence of catalyst with a 1 to 20 weight % solution of hydrogen peroxide in cyclohexanone and ammonia as gaseous or liquid ammonia, the only water present during the reaction being that formed in the reaction at a temperature of 20° to 80°C.

3,983,132

BRANCHED CHAIN DODECYL ISOMERIC MIXTURES OF 2-(5-DODECYL-2-HYDROXY PHENYL) BENZOTRIAZOLE AS STABILIZERS FOR HEAT AND LIGHT SENSITIVE MATERIALS

Albert F. Strobel, Delmar, N.Y., assignor to GAF Corporation, New York, N.Y.

Filed Aug. 23, 1974, Ser. No. 500,083

Int. Cl.² C07D *249/20*

U.S. Cl. 260—308 B 13 Claims

1. A normally liquid composition for stabilizing heat and light sensitive materials consisting essentially of a mixture of branched-chain dodecyl isomers of 2-(5′-dodecyl-2′-hydroxyphenyl) benzotriazole said mixture having a melting point below 0°C.

3,983,133

2-SUBSTITUTED IMIDAZOLINES

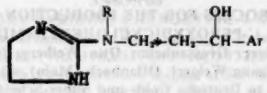
Josephus Ludovicus Hubertus Van Gelder; Alfons Herman Margaretha Raeymaekers, both of Beerse; Leopold Frans Corneel Roevens, Rijkevorsel, and Willy Joannes Van Laerhoven, Ravels, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Division of Ser. No. 499,744, Aug. 13, 1974, Pat. No. 3,923,808, which is a division of Ser. No. 313,285, Dec. 8, 1972, Pat. No. 3,865,836. This application Apr. 16, 1975, Ser. No. 568,751

Int. Cl.² C07D *233/48*

U.S. Cl. 260—309.6 2 Claims

1. A chemical compound having the formula:



wherein:

R is a member selected from the group consisting of hydrogen and benzyl;

Ar is a member selected from the group consisting of phenyl, loweralkylphenyl, halophenyl and dihalophenyl.

3,983,134

UREYLENETHIOPHANES AND THEIR RELATED COMPOUNDS, AND PRODUCTION THEREOF

Masanao Matsui, Tokyo; Kenji Mori, Kawasaki; Takeshi Kitahara, Tokyo; Seiichi Kitamura, Ibaraki, and Kazumasa Ohba, Itami, all of Japan, assignors to Teikoku Chemical Industry Co., Ltd., Osaka, Japan

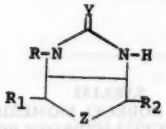
Filed Aug. 5, 1975, Ser. No. 602,178

Claims priority, application Japan, Aug. 5, 1974, 49-90112; Aug. 6, 1974, 49-90613; Aug. 8, 1974, 49-91685

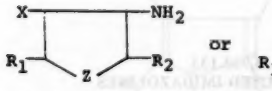
Int. Cl.² C07D *49/34*

U.S. Cl. 260—309.7 7 Claims

1. A process for preparing compounds of the formula



wherein R is a hydrogen atom, a lower alkyl group, a phenyl lower alkyl group or a naphthyl lower alkyl group, R_1 and R_2 are each a hydrogen atom or an aliphatic hydrocarbon group having not more than 10 carbon atoms or an aliphatic hydrocarbon group having not more than 10 carbon atoms bearing, at the terminal position, a carboxyl group or a lower alkoxycarbonyl group, a phenyl(lower)-alkoxycarbonyl group, a naphthyl(lower)alkoxycarbonyl group, a cyano group, a carboxyl group or a formyl group convertible to a carboxyl group, y is an oxygen atom or a sulfur atom and Z is an oxygen atom, a sulfur atom, a sulfinyl atom or a sulfonyl group, said compounds having a cis-configuration on the ureylene or thioureylene juncture, which process compises reacting a compound of the formula:



wherein X is a halogen atom, and R_1, R_2 and Z are each as defined above, with an isocyanate or isothiocyanate of the formula

R–NCY

wherein R and Y are each as defined above, or the ammonium, alkali metal or alkaline earth metal salt of isocyanic acid or isothiocyanic acid.

3,983,135

4-OXO-2-IMIDAZOLIDINYLIDENE UREAS

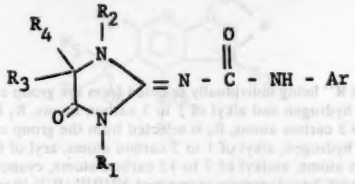
Chris Royce Rasmussen, Ambler, Pa., assignor to McNeil Laboratories, Incorporated, Fort Washington, Pa.

Continuation-in-part of Ser. No. 508,795, Sept. 23, 1974, abandoned, which is a continuation-in-part of Ser. No. 408,022, Oct. 19, 1973, abandoned. This application June 23, 1975, Ser. No. 589,494

Int. Cl.² C07D *233/32*

U.S. Cl. 260—309.7 17 Claims

1. A 4-oxo-2-imidazolidinylidene urea having the formula:



wherein

R_1 is a member selected from the group consisting of hydrogen and loweralkyl;

R_2 is a member selected from the group consisting of hydrogen and loweralkyl;

R_3 is a member selected from the group consisting of hydrogen, phenyl, nitrophenyl, trifluoromethylphenyl, diloweralkylaminophenyl, and phenyl substituted with from one to three members each selected from the group consisting of halo, loweralkyl, and loweralkoxy;

R_4 is a member selected from the group consisting of hydrogen, phenyl, nitrophenyl, trifluoromethylphenyl, diloweralkylaminophenyl, phenyl substituted with from one to three members each selected from the group consisting of halo, loweralkyl, and loweralkoxy, and phenylalkyl; and

Ar is a member selected from the group consisting of phenyl, nitrophenyl, trifluoromethylphenyl, diloweralkylaminophenyl, and phenyl substituted with from one to three members each selected from the group consisting of halo, loweralkyl, and loweralkoxy;

provided that said R_3 and said R_4 are other than 2,6-disubstituted phenyl.

3,983,136

INTERMEDIATES FOR PRODUCING PROSTAGLANDINS

George E. Just, Westmont, Canada, and Chaim Simonovitch, Rishon-Le-Zion, Israel, assignors to George E. Just, Westmount, Canada

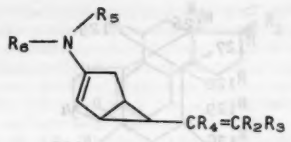
Division of Ser. No. 281,341, Aug. 17, 1972, Pat. No. 3,920,643, which is a continuation of Ser. No. 103,334, Dec. 31, 1970, abandoned, which is a continuation-in-part of Ser. No. 657,085, July 31, 1967, abandoned. This application July 21, 1975, Ser. No. 597,592

Claims priority, application United Kingdom, Aug. 9, 1966, 35550/66; Jan. 24, 1967, 3588/67

Int. Cl.² C07D *207/06*

U.S. Cl. 260—326.8 2 Claims

1. A compound of the formula



wherein R_2 is alkyl of 4 to 8 carbon atoms, inclusive, wherein R_3 and R_4 are hydrogen or methyl, and wherein R_5 and R_6 together with the nitrogen form pyrrolidino.

3,983,137

PROCESS FOR PREPARING 3-(INDOL-3-yl)-DEHYDRONAPHTHALIDE HYDROCHLORIDES

Yunn H. Chiang, Woburn, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 420,931, Dec. 3, 1973, Pat. No. 3,933,854. This application Sept. 4, 1975, Ser. No. 610,249

Int. Cl.² C07D *209/18, 209/20*

U.S. Cl. 260—326.12 R **12 Claims**

1. A process which comprises reacting 1.0 mole of a 3-(indol-3-yl)naphthalide and 1.5 to 2.5 mole of o-chloranil in a hydrocarbon solvent at a temperature between 100° and 200°C. in the presence of glacial acetic acid to yield the corresponding 3-(indol-3-yl)dehydronaphthalide hydrochloride, said acid and solvent being used in a ratio of between about 1:12 and 1:50 gram/mls.

6. a process as defined in claim 1 which includes the additional step of reacting 1.0 mole of said 3-(indol-3-yl)dehydronaphthalide hydrochloride and 1.0 to 1.5 moles of an indole at a temperature between 80° and 150°C. in a hydrocarbon solvent in the presence of glacial acetic acid, said acid and solvent being used in a ratio of between about 4:75 and 6:75 grams/mls.

3,983,138

AMINO ACID ESTERS

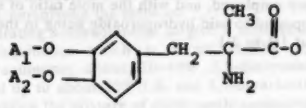
Walfred S. Saari, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

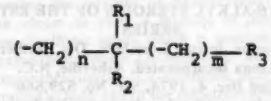
Continuation-in-part of Ser. No. 400,609, Sept. 25, 1973, abandoned. This application June 25, 1974, Ser. No. 482,102

Int. Cl.² C07D *207/40*

U.S. Cl. 260—326.43 **17 Claims**

1. A compound of the formula:





wherein

n is 0, 1, 2 or 3;

m is 0, 1, 2 or 3;

A_1 and A_2 are individually H or a lower alkanoyl group

R_1 and R_2 are individually H or alkyl of 1 to 3 carbon atoms and;

R_3 is succinimido; or a pharmaceutically acceptable acid addition salt thereof.

3,983,139

3-(HYDROXYHYDROCARBYLSECONDARYAMINO)THIOPHENE 1,1-DIOXIDES AND POLYURETHANES CHAIN EXTENDED THEREWITH

Chung-Ling Mao, Sandy Hook, Conn., assignor to Uniroyal Inc., New York, N.Y.

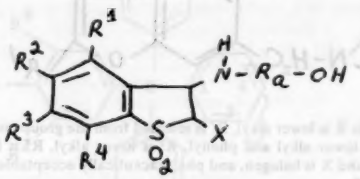
Division of Ser. No. 434,470, Jan. 18, 1974, Pat. No. 3,887,503. This application Feb. 24, 1975, Ser. No. 552,498

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² C07D *333/66*

U.S. Cl. 260—330.5 **7 Claims**

1. A 3-(hydroxyhydrocarbylsecondary-amino)-2,3-dihydrobenzo(b) thiophene 1, 1-dioxide of the following formula



wherein

X may be hydrogen, an alkyl group having 1 to 5 carbon atoms or a halogen atom,

R_a may be (1) an open chain alkylene group having 2 to 10 carbon atoms (2) an open chain alkylene group having 2 to 10 carbon atoms substituted with one or more phenyl groups, or (3) a cycloalkylene group having 4 to 8 carbon atoms,

the hydroxyl group being attached to a carbon atom of R_a that is separated from the secondary amino nitrogen atom by at least one carbon atom, and

R^1, R^2, R^3 and R^4 are the same or different and are hydrogen, an alkyl group having 1 to 5 carbon atoms, or halogen.

3,983,140

PHYSIOLOGICALLY ACTIVE SUBSTANCES

Akira Endo; Masao Kuroda; Akira Terahara; Yoshio Tsujita, and Chihiro Tamura, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

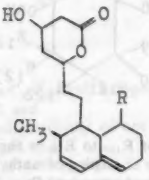
Filed May 12, 1975, Ser. No. 576,651

Claims priority, application Japan, June 7, 1974, 49-64823

Int. Cl.² C07D *309/30*

U.S. Cl. 260—343.5 **4 Claims**

1. A compound having the formula



wherein R is hydrogen atom, hydroxy group or 2-methylbutyryloxy group.

3,983,141
DERIVATIVES OF 5-HYDROXY-6-DILOWERALKYLAMINOMETHYL-BENZOFURANS

Alexei Nikolaevich Grinev, ulitsa Volgina, 15, korpus 2, kv. 57, Moscow; Alexandr Alexandrovich Stolyarchuk, ulitsa R. Ljuxemburg, 1, kv. 12, Vinnitsa; Pavel Alexandrovich Galenko-Yaroshevsky, ulitsa Kosmonavtov, 52, kv. 14, Vinnitsa; Vladimir Spiridonovich Tantsjura, ulitsa Litvinenko, 2, kv. 5, Vinnitsa, and Natalya Vitalievna Arkhangelskaya, Krasnoprudnaya ulitsa, 26, kv. 36, Moscow, all of U.S.S.R.

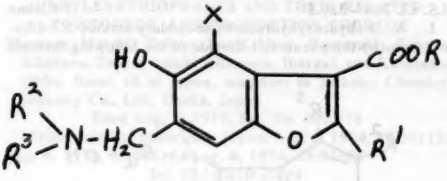
Filed May 13, 1974, Ser. No. 469,528

Claims priority, application U.S.S.R., May 18, 1973, 1924401

Int. Cl.² C07D *307/84*

U.S. Cl. 260—346.2 R **4 Claims**

1. A compound of the formula:



wherein R is lower alkyl, R′ is selected from the group consisting of lower alkyl and phenyl, R^2 is lower alkyl, R^3 is lower alkyl, and X is halogen, and pharmaceutically acceptable salts thereof.

3,983,142
PEROXY COMPOUNDS AND PROCESSES FOR THEIR PREPARATION

Edwin George Edward Hawkins, Lower Kingswood, England, assignor to BP Chemicals International Limited, Great Britain

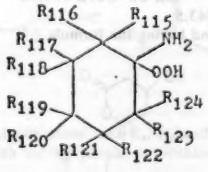
Division of Ser. No. 651,969, July 10, 1967. This application Dec. 13, 1974, Ser. No. 532,587

Claims priority, application United Kingdom, July 13, 1966, 31380/66; Mar. 2, 1967, 9963/67; Mar. 2, 1967, 9973/67; May 20, 1967, 23546/67; May 20, 1967, 23547/67

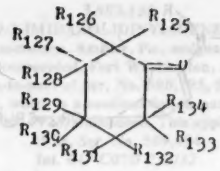
Int. Cl.² C07D *303/04*; C07C *179/08*

U.S. Cl. 260—348 C **10 Claims**

1. A process for the production of a compound of the formula



wherein at least one of R_{117} to R_{122} is the same substituent selected from the group consisting of methyl, ethyl and propyl and the rest are each hydrogen; and R_{115}, R_{116}, R_{123} and R_{124} are each hydrogen; which comprises reacting a compound of the formula



wherein at least one of R_{127} to R_{132} is the same substituent selected from the group consisting of methyl, ethyl and propyl and the rest are each hydrogen; and R_{125}, R_{126}, R_{133} and R_{134} are each hydrogen; with hydrogen peroxide and ammonia.

3,983,143
EPOXIDATION OF OLEFINS WITH LESS STABLE ORGANIC HYDROPEROXIDES BY USING AN ALCOHOL STABILIZING AGENT

Ming N. Sheng, Cherry Hill, N.J.; John G. Zajacek, Devon, Pa., and Thomas N. Baker, III, Sudbury, Mass., assignors to Atlantic Richfield Company, Los Angeles, Calif.

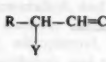
Division of Ser. No. 290,592, Sept. 20, 1972, Pat. No. 3,862,961, which is a continuation-in-part of Ser. No. 95,375, Dec. 4, 1970, abandoned. This application Nov. 6, 1974, Ser. No. 521,324

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² C07D *301/20*

U.S. Cl. 260—348.5 L **6 Claims**

1. A method for the epoxidation of olefins characterized by having the formula



wherein R is hydrogen or an alkyl group having from 1 to 17 carbon atoms and Y is hydrogen, employing as the oxidizing agent a less stable organic hydroperoxide selected from the group consisting of cyclohexyl hydroperoxide and amylene hydroperoxide which compirses contacting said olefin with said hydroperoxide in the presence of a molybdenum-containing catalyst and as a stablilizing compound cyclohexanol at a temperature ranging between 50°C. to 140°C. under a pressure of at least the autogenous pressure of the reaction at the temperature employed, and with the mole ratio of said stabilizing compound to said hydroperoxide being in the range of from about 1:1 to 3:1.

3,983,144
NOVEL 11β-ALKYL STEROIDS OF THE ESTRANE SERIES

Johannes Antonius Joseph Leemhuis, Oss, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

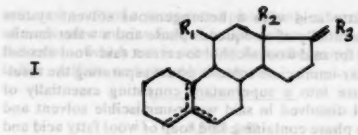
Filed Dec. 4, 1974, Ser. No. 529,666

Claims priority, application Netherlands, Dec. 19, 1973, 7317358

Int. Cl.³ C07J *1/00*

U.S. Cl. 260—397.3 **6 Claims**

1. Novel steroids of the estrane series having the general formula I:



I

wherein

R_1 and R_2 = an alkyl group having 1–4 carbon atoms,

R_3 = O or (α P) (β Q), wherein

P = H or a saturated or an unsaturated alkyl group having 1–4 carbon atoms, and

Q = hydroxy, acyloxy derived from an organic carboxylic acid having 1–18 carbon atoms, or an ether group selected from the group consisting of saturated or unsaturated alkoxy having 1–4 carbon atoms, cycloalkoxy having 5 or 6 carbon atoms and tetrahydropyranyloxy and

a double bond is present departing from carbon atom 5.

3,983,145

USE OF ALPHA-DI(LOWER ALKOXY) ANTHRAQUINONES IN THE SYNTHESIS OF ALIZARIN SAPHIROLS

David L. White, and Joseph W. Fitzpatrick, both of Toms River, N.J., assignors to Toms River Chemical Corporation, Toms River, N.J.

Filed Nov. 1, 1973, Ser. No. 411,625

Int. Cl.² C07C *143/665*

U.S. Cl. 260—373 **6 Claims**

1. A process for making 1,5-dihydroxy-4,8-diaminoanthraquinone-2,6-disulfonic acid, 1,8-dihydroxy-4,5-diaminoanthraquinone-2,7-disulfonic acid and mixtures thereof, comprising the steps of:

1. nitrating anthraquinone to give a mixture of dinitroanthraquinones which is about 50-60% 1,5-dinitroanthraquinone, about 30–40% 1,8-dinitroanthraquinone and up to about 20% 1,6- and 1,7-dinitrianthraquinone;
2. treating the mixture of dinitroanthraquinones with lower alkanolic caustic to convert the nitro groups to lower alkoxy groups and yield a mixture of diloweralkoxy anthraquinones which is predominantly 1,5- and 1,8-diloweralkoxyanthraquinone;
3. treating the mixture of diloweralkoxy anthraquinones with oleum to yield a mixture of dihydroxyanthraquinone-disulfonic acids which is predominantly 1,5-dihydroxyanthraquinone-2,6-disulfonic acid and 1,8-dihydroxyanthraquinone-2,7-disulfonic acid;
4. nitrating at least one of the dihydroxyanthraquinonedisulfonic acids to give a dihydroxy-dinitroanthraquinonedisulfonic acid; and
5. reducing the nitro groups of the dihydroxy-dinitroanthraquinone-disulfonic acid to give a dihydroxy-diaminoanthraquinonedisulfonic acid.

3,983,146

PROCESS FOR THE PRODUCTION OF $\alpha, \alpha, \alpha, \alpha', \alpha', \alpha'$, -HEXAKISARYL-1,3-AND-1,4-DIMETHYL BENZENES

Erhard Tresper; Dieter Freitag, both of Krefeld, and Dieter Neuray, Rumeln-Kaldenhausen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

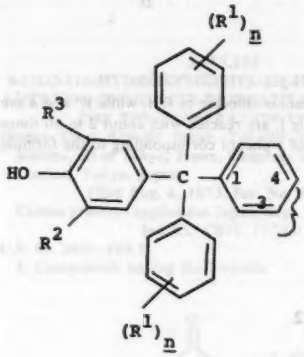
Filed May 21, 1975, Ser. No. 579,533

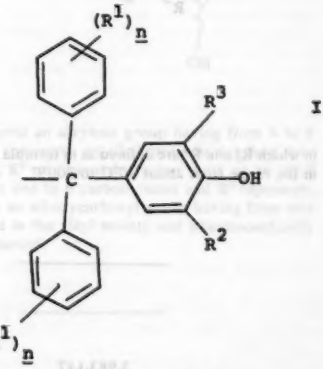
Claims priority, application Germany, May 24, 1974, 2425193

Int. Cl.² C09B *11/06*

U.S. Cl. 260—395 **4 Claims**

1. A process for the production of $\alpha,\alpha,\alpha,\alpha',\alpha',\alpha'$-hexakisaryl-1,3- and -1,4-dimethyl benzenes corresponding to the formula





I

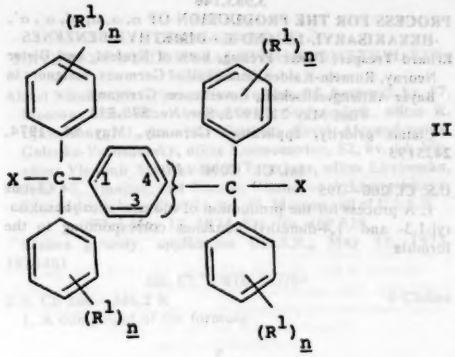
in which

R^1 represents C_1-C_4 alkyl, halogen or H,

n = 1, 2 or 3, and

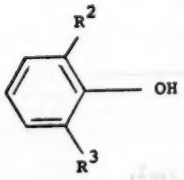
R^2 and R^3 independently of one another represent C_1-C_3 alkyl, halogen or H,

wherein $\alpha,\alpha,\alpha',\alpha'$-tetrakisaryl-1,3- or 1,4-bis-(chloromethyl) or -bis-(hydroxymethyl)-benzenes corresponding to the formula



II

in which X represents chlorine or OH, while R^1 and *n* are defined as in formula I, are reacted with about 2 to 30 times the molar quantity of a phenol corresponding to the formula



III

in which R^2 and R^3 are defined as in formula I, at temperatures in the range from about 30°C to 300°C.

3,983,147

SEPARATION OF WOOL FATTY ACID

Hisakazu Senda; Toshiaki Yamamoto; Hiroshi Ueno, and Kazuo Nakano, all of Kyoto, Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed May 31, 1974, Ser. No. 475,110

Claims priority, application Japan, June 12, 1973, 48-66542; Aug. 7, 1973, 48-88974; May 4, 1974, 49-50103

Int. Cl.[2] C11B *1/10*; C11B *3/06*; C11C *1/04*; C07J *4/00*

U.S. Cl. 260—412.8 **8 Claims**

1. In a method for separating wool fatty acid from wool alcohol by treating a saponified wool wax containing a soap of said wool fatty acid with a heterogeneous solvent system consisting essentially of an aqueous phase and a water-immiscible solvent for said wool alcohol to extract said wool alcohol into said water-immiscible solvent, phase separating the resultant admixture into a supernatant consisting essentially of wool alcohol dissolved in said water-immiscible solvent and said aqueous phase containing said soap of wool fatty acid and recovering respective phases therefrom, the improvement which comprises:

treating a saponified wool wax containing said wool alcohol and a binary metal soap of said wool fatty acid with said heterogeneous solvent system, said binary metal soap being formed with an alkali metal and a multivalent metal present in said saponified wool wax, the equivalent ratio of said multivalent metal being less than 0.9 relative to said alkali metal and greater than 0.5 relative to said wool wax.

8. A method for removing free wool fatty acid from crude wool wax containing at least 5% by weight of said wool fatty acid therein which comprises

a. neutralizing said free fatty acid present in said crude wax with an alkali metal hydroxide, carbonate or lower alkoxide and a multivalent metal hydroxide, oxide or water-soluble salt to produce a binary metal soap of said wool fatty acid, the amount of said multivalent compound being greater than 0.3 equivalent relative to said free wool fatty acid present in said crude wax but less than 0.9 equivalent relative to said alkali metal compound;

b. treating the resultant mixture with a heterogeneous solvent system consisting essentially of an aqueous phase and a water-immiscible solvent for pure wool wax to extract said pure wool wax into said water-immiscible solvent; and

c. separating the resultant aqueous phase containing said binary metal soap from the supernatant consisting essentially of purified wool wax dissolved in said water-immiscible solvent.

3,983,148

PROCESS FOR PRODUCING CYCLIC SILOXANES

James Dale Reedy, Williamstown, and Harold D. Furbee, Sistersville, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Aug. 29, 1975, Ser. No. 608,986

Int. Cl.[2] C07F *7/08*

U.S. Cl. 260—448.2 E **13 Claims**

1. In a process for preparing cyclic siloxane compounds, said process consisting essentially of the hydrolysis and condensation of a hydrolyzable organosilicon compound, the improvement comprising increasing the yield of said cyclic siloxane compounds by hydrolyzing and condensing said organosilicon compound in the presence of a cationic surface active agent, said agent being essentially soluble only in the aqueous phase of said process, wherein the concentration of the cationic surface active agent in said aqueous phase is from about 0.01 to about 10 weight percent, wherein said cationic surface active agent is selected from the class consisting of a salt of a protonated amine, a quaternary ammonium salt, a salt of a protonated carboxylic acid, a salt of a protonated alcohol, a salt of a protonated nitrile, a salt of a protonated sulfoxide, a salt of a protonated mercaptan, a quaternary phosphonium

salt, and a salt of a protonated phosphine, wherein the cation of each salt contains from 5 to 30 carbon atoms, and wherein the anion of each salt is selected from the group consisting of halide, sulfate, and phosphate anions.

3,983,149

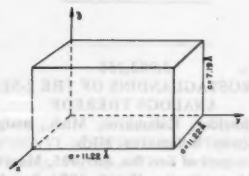
AMMUNITION PRIMING MIXTURES AND METHOD OF FORMING SAME

Joseph F. Kenney, Bridgeport, Conn., assignor to Remington Arms Company, Inc., Bridgeport, Conn.

Continuation-in-part of Ser. No. 489,704, July 18, 1974, abandoned. This application Apr. 29, 1975, Ser. No. 572,829

Int. Cl.² C07F 7/24; C06B 41/02

U.S. Cl. 260—435 A 6 Claims



TETRAGONAL UNIT CELL OF NEW FORM OF LEAD STYPHNATE

a = 11.22 Å
c = 7.19 Å
d.m. = 1.96
V = $a^2c = 905Å^3 = 9.05 \times 10^{-22}cm^3$
5 Pb - Styphnate Molecules per cell

1. The method of making a new form of normal lead styphnate which consists of reacting styphnic acid free from the impurities usually present in commercial styphnic acid in the presence of water with a non-explosive compound of lead selected from the group of lead compounds consisting of lead oxide, basic lead carbonate, lead carbonate, and lead hydroxide to produce a workable, granular, wet mass of the new form of normal lead styphnate and no by products of the reaction except water or water and carbon dioxide, said new form of normal lead styphnate in the wet state being insensitive to heat, shock, friction, or electrostatic discharge.

3,983,150

METHOD OF MANUFACTURE OF N-ALKYLIMINOALANES

Bohuslav Casensky, Prague; Jiri Machacek, Rozroky, and Tomas Hanslik, Prague, all of Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Mar. 26, 1975, Ser. No. 562,359

Claims priority, application Czechoslovakia, Mar. 28, 1974, 2250-74

Int. Cl.² C07F 5/06

U.S. Cl. 260—448 R 8 Claims

1. Method for the preparation of N-alkyliminoalanes of the general formula:

wherein R is an alkyl group having from 2–6 carbon atoms and *n* is an integer from 4 to 8 which comprises reacting a primary amine of the general formula R—NH_2 wherein R is as denoted above, in an organic solvent, with aluminum and hydrogen at a temperature within the range of 70°–240°C at a pressure ranging from 20–500 atmospheres in the presence of an initiator.

3,983,151

PROCESS FOR THE PREPARATION OF 4-HYDROXY-3-METHOXY-PHENYLACETONITRILE

Horst Meyer, Wuppertal, Germany, assignor to Bayer Aktiengesellschaft, Germany

Filed Nov. 21, 1975, Ser. No. 634,126

Claims priority, application Germany, Dec. 3, 1974, 2457079

Int. Cl.² C07C 121/75

U.S. Cl. 260—465 F 10 Claims

1. The process for the preparation of 3-methoxy-4-hydroxyphenylacetonitrile which comprises allowing an N-(lower alkyl)-3-methoxy-4-hydroxybenzylamine to react with hydrogen cyanide in a diluent at temperatures of from about 100°C to about 190°C.

3,983,152

9-OXO-11α-HYDROXYMETHYL-15ξ-HYDROXYPROST-13(TRANS)-ENOIC ACID DERIVATIVES AND PROCESS FOR THE PREPARATION THEREOF

Osamu Oda; Kiyoshi Sakai; Takashi Yusa, and Hamako Katano, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

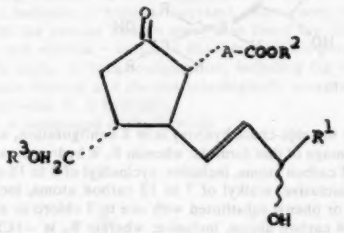
Filed Aug. 6, 1973, Ser. No. 385,868

Claims priority, application Japan, Sept. 1, 1972, 47-88172

Int. Cl.² C07C 177/00

U.S. Cl. 260—468 D 6 Claims

1. Compounds having the formula



wherein A represents an alkylene group having from 4 to 8 carbon atoms, R^1 represents an alkyl group having fron 4 to 10 carbon atoms, R^2 represents hydrogen atom or an alkyl group having from one to 6 carbon atoms and R^3 represents hydrogen atom or an alkoxycarbonyl group having from one to 6 carbon atoms in the alkyl moiety and pharmaceutically acceptable salts thereof.

3,983,153

RACEMIC FLUORO-SUBSTITUTED PGE_2 ANALOGS

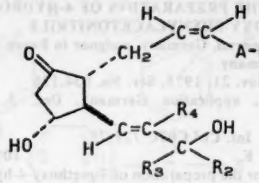
William P. Schneider, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 807,405, March 14, 1969, abandoned. This application Dec. 6, 1974, Ser. No. 530,430

Int. Cl.² C07C 177/00

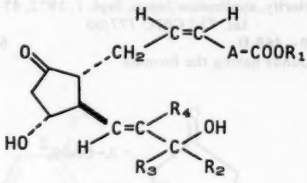
U.S. Cl. 260—468 D 17 Claims

1. A racemic compound of the combination of the formula:



wherein the side-chain hydroxy is in S configuration, and the mirror image of that formula; wherein R_1 is hydrogen, alkyl of one to 8 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one to 3 chloro or alkyl of one to 4 carbon atoms, inclusive; wherein R_2 is $-(CH_2)_a-CH_3$ wherein *a* is 2, 3, 4, 5, or 6, or $-(CH_2)_d-X$ wherein *d* is zero, one, 2, 3, or 4 and X is isobutyl, tert-butyl, 3,3-difluorobutyl, 4,4-difluorobutyl, or 4,4,4-trifluorobutyl; wherein R_3 and R_4 are hydrogen or alkyl of one to 4 carbon atoms, inclusive; wherein A is $-CH_2-Z-$ wherein Z is ethylene substituted with one or 2 fluoro; and pharmacologically acceptable salts thereof when R_1 is hydrogen.

11. A racemic compound of the combination of the formula:



wherein the side-chain hydroxy is in S configuration, and the mirror image of that formula; wherein R_1 is hydrogen, alkyl of one to 8 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one to 3 chloro or alkyl of one to 4 carbon atoms, inclusive; wherein R_2 is $-(CH_2)_d-X$ wherein *d* is zero, one, 2, 3, or 4 and X is 3,3-difluorobutyl, 4,4-difluorobutyl, or 4,4,4-trifluorobutyl; wherein R_3 and R_4 are hydrogen or alkyl of one to 4 carbon atoms, inclusive; wherein A is trimethylene or $-CH_2-Z-$ wherein Z is ethylene substituted with one or 2 fluoro, methyl, or ethyl; and pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,983,154

RACEMIC PROSTAGLANDINS OF THE 2-SERIES AND ANALOGS THEREOF

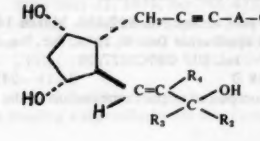
William P. Schneider, Kalamazoo Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 807,405, March 14, 1969, abandoned. This application Dec. 6, 1974, Ser. No. 530,433

Int. Cl.² C07C *177/00*

U.S. Cl. 260—468 D **12 Claims**

1. A racemic compound of the combination of the formula:



wherein the side-chain hydroxy is in S configuration, and the mirror image of that formula; wherein R_1 is hydrogen, alkyl of one to 8 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one to 3 chloro or alkyl of one to 4 carbon atoms, inclusive; wherein R_2 is $-(CH_2)_a-CH_3$ wherein *a* is 2, 3, 4, 5, or 6, or $-(CH_2)_d-X$ wherein *d* is zero, one, 2, 3, or 4 and X is isobutyl, tert-butyl, 3,3-difluorobutyl, 4,4-difluorobutyl, or 4,4,4-trifluorobutyl; wherein R_3 and R_4 are hydrogen or alkyl of one to 4 carbon atoms, inclusive; wherein A is trimethylene or $-CH_2-Z-$ wherein Z is ethylene substituted with one or 2 fluoro, methyl, or ethyl; and pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,983,155

RACEMIC PROSTAGLANDINS OF THE 2-SERIES AND ANALOGS THEREOF

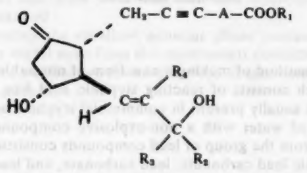
William P. Schneider, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 807,405, March 14, 1969, abandoned. This application Dec. 6, 1974, Ser. No. 530,432

Int. Cl.² C07C *177/00*

U.S. Cl. 260—468 D **12 Claims**

1. A racemic compound of the combination of the formula:



wherein the side-chain hydroxy is in S configuration, and the mirror image of that formula; wherein R_1 is hydrogen, alkyl of one to 8 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one to 3 chloro or alkyl of one to 4 carbon atoms, inclusive; wherein R_2 is $-(CH_2)_a-CH_3$ wherein *a* is 2, 3, 4, 5, or 6, or $-(CH_2)_d-X$ wherein *d* is zero, one, 2, 3, or 4 and X is isobutyl, tert-butyl, 3,3-difluorobutyl, 4,4-difluorobutyl, or 4,4,4-trifluorobutyl; wherein R_3 and R_4 are hydrogen or alkyl of one to 4 carbon atoms, inclusive; wherein A is trimethylene or $-CH_2-Z-$ wherein Z is ethylene substituted with one or 2 fluoro, methyl, or ethyl; and pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,983,156

SUBSTITUTED ω-NITROACETOPHENONES

Derek Richard Buckle, Redhill; Harry Smith, Maplehurst, near Horsham, and Barrie Christian Charles Cantello, Horsham, all of England, assignors to Beecham Group Limited, Middlesex, England

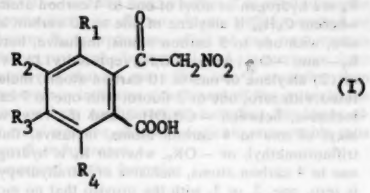
Filed Mar. 26, 1974, Ser. No. 454,922

Claims priority, application United Kingdom, Apr. 3, 1973, 15882/73

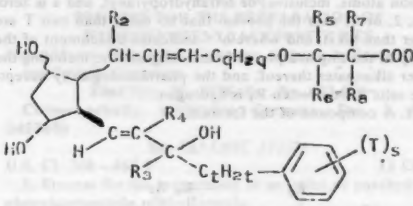
Int. Cl.² C07C *79/46*

U.S. Cl. 260—471 R **7 Claims**

1. A compound of formula (I) or a pharmaceutically acceptable salt or ester thereof:



(I)



wherein R_1 and R_4 are hydrogen and R_2 and R_3 are methyl, ethyl, n-propyl or n-butyl groups.

3,983,157

4-OXA PHENYL-SUBSTITUTED PGF COMPOUNDS

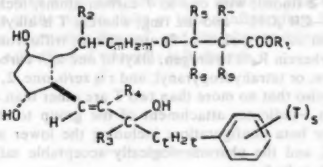
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 459,759, April 11, 1974, Pat. No. 3,931,289, which is a continuation of Ser. No. 185,448, Sept. 30, 1971, abandoned, which is a continuation-in-part of Ser. No. 103,338, Dec. 31, 1970, abandoned. This application Oct. 23, 1975, Ser. No. 625,180

Int. Cl.² C07C 69/76

U.S. Cl. 260—473 A 32 Claims

1. A compound of the formula:

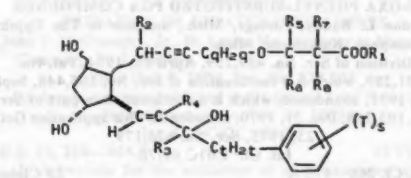


wherein R_1 is hydrogen, alkyl of one to 8 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive, or ethyl substituted in the 3-position with 3 -chloro, 2 or 3 bromo, or 1, 2, or 3 iodo; wherein R_2, R_3, R_4, R_5, R_6, R_7, and R_8 are hydrogen or alkyl of one to 4 carbon atoms, inclusive; wherein C_mH_{2m} is alkylene of one to 9 carbon atoms, inclusive, with one to 4 carbon atoms, inclusive, between $-CHR_7-$ and -O-; wherein C_tH_{2t} represents (1) a valence bond or (2) alkylene of one to 10 carbon atoms, inclusive, substituted with zero, one, or 2 fluoro, with one to 7 carbon atoms, inclusive, between $-CR_9OH-$ and the ring; wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $—OR_9$, wherein R_9 is hydrogen, alkyl of one to 4 carbon atoms, inclusive or tetrahydropyranyl, and s is zero, one, 2, or 3, with the proviso that no more than two T are other than alkyl; and wherein ~ indicates attachment of the group to the ring in alpha or beta configuration; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

27. A compound of the formula:

wherein R_1 is hydrogen, alkyl of one to 8 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive phenyl, phenyl substituted with one, 2, or 3chloro or alkyl of one to 4 carbon atoms, inclusive, or ethyl substituted in the β-position with 3-chloro, 2 or 3 bromo, or 1, 2, or 3 iodo; wherein R_2, R_3, R_4, R_5, R_6, R_7, and R_8 are hydrogen or alkyl of one to 4 carbon atoms, inclusive; wherein C_qH_{2q} is alkylene of one to 7 carbon atoms, inclusive, with one or 2 carbon atoms between —CH=CH— and —O—; wherein C_tH_{2t} represents a valence bond or alkylene of one to 10 carbon atoms, inclusivve, substituted with zero, one, or 2 fluoro, with one to 7 carbon atoms, inclusive, between $-CR_9OH-$ and the ring; wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $-OR_9$, wherein R_9 is hydrogen, alkyl of one to 4 carbon atoms, inclusive, or tetrahydropyranyl, and s is zero, one, 2, or 3, with the proviso that no more than two I are other than alkyl; and wherein ~ indicates attachment of the group to the ring in alpha or beta configuration; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

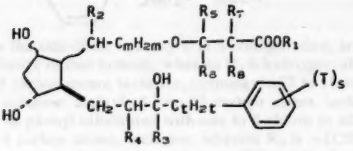
29. A compound of the formula:



wherein R_1 is hydrogen, alkyl of one to 8 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl or one to 4 carbon atoms, inclusive, or ethyl substituted in the β-position with 3 chloro, 2 or 3bromo, or 1, 2, or 3 iodo; wherein R_2, R_3, R_4, R_5, R_6, R_7, and R_8 are hydrogen or alkyl of one to 4 carbon atoms, inclusive; wherein C_qH_{2q} is alkylene of one to 7 carbon atoms, inclusive, with one or 2 carbon atoms between —C ≡ C— and —O—; wherein CtH_{2t} represents (1) a valence bond or (2) alkylene of one to 10 carbon atoms, inclusive, substituted with zero, one, or 2 fluoro, with one to 7 carbon atoms, inclusive, between $—CR_9OH—$ and the ring; wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $—OR_9$, wherein R_9 is hydrogen, alkyl of one to 4

carbon atoms, inclusive, or tetrahydropyranyl, and s is zero, one, 2, or 3, with the proviso that no more than two T are other than alkyl; and wherein ~ indicates attachment of the group to the ring in alpha or beta configuration; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

31. A compound of the formula:



wherein R_1 is hydrogen, alkyl of one to 8 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of b 7 to 12carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive, or ethyl substituted in the β-position with 3 chloro, 2 or 3 bromo, or 1, 2, or 3 iodo; wherein R_2, R_3, R_4, R_5, R_6, R_7, and R_8 are hydrogen or alkyl of one to 4 carbon atoms, inclusive; wherein C_mH_{2m} is alkylene of one to 9 carbon atoms, inclusive, with one to 4 carbon atoms, inclusive, between —CHR_3— and —O—; wherein C_tH_{2t} represents (1) a valence bond or (2) alkylene of one to 10 carbon atoms, inclusive, substitued with zero, one, or 2 fluoro, with one to 7 carbon atoms, inclusive, between —CR_3OH— and the ring; wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or —OR_9, wherein R_9 is hydrogen, alkyl or one to 4 carbon atoms, inclusive, or tetrahydropyranyl, and s is zero, one, 2, or 3, with the proviso that no more than two T are other than alkyl; and wherein ~ indicates attachment of the group to the ring in alpha or beta configuration; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,983,158

3-OXA PHENYL-SUBSTITUTED PGA COMPOUNDS

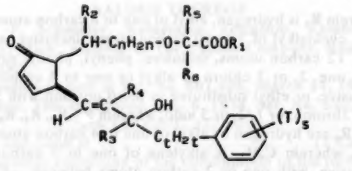
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 459,759, April 11, 1974, Pat. No. 3,931,289, which is a continuation of Ser. No. 185,448, Sept. 30, 1971, abandoned, which is a continuation-in-part of Ser. No. 103,338, Dec. 31, 1970, abandoned. This application Oct. 23, 1975, Ser. No. 625,179

Int. Cl.² C07C *69/76*

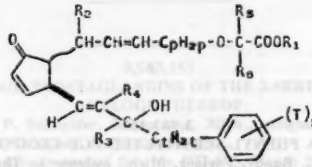
U.S. Cl. 260—473 A **28 Claims**

1. A compound of the formula:



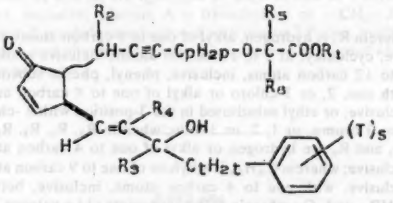
wherein R_1 is hydrogen, alkyl of one to 8 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive, or ethyl substituted in the β-position with 3 -chloro, 2 or 3 bromo, or 1, 2, or 3 iodo; wherein R_2, R_3, R_4, R_5, and R_6 are hydrogen or alkyl of one to 4 carbon atoms, inclusive; wherein C_nH_{2n} is alkylene of one to 10 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, between —CHR_2— and —O—; wherein C_tH_{2t} represents (1) a valence bond or (2) alkylene of one to 10 carbon atoms, inclusive, substituted with zero, one or 2 fluoro, with one to 7 carbon atoms, inclusive, between —CR_3OH— and the ring; wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or —OR_9, wherein R_9 is hydrogen, alkyl of one to 4 carbon atoms, inclusive or tetrahydropyranyl, and s is zero, one, 2, or 3, with the proviso that no more than two T are other than alkyl; and wherein ~ indicates attachment of the group to the ring in alpha or beta configuration; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

23. A compound of the formula:



wherein R_1 is hydrogen, alkyl of one to 8 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive phenyl, phenyl substituted with one, 2, or 3chloro or alkyl of one to 4 carbon atoms, inclusive, or ethyl substituted in the β-position with 3-chloro, 2 or 3 bromo, or 1, 2, or 3 iodo; wherein R_2, R_3, R_4, R_5 and R_6 are hydrogen or alkyl of one to 4 carbon atoms, inclusive; wherein C_pH_{2p} is alkylene of one to 8 carbon atoms, inclusive, with 1 or 2 carbon atoms between —CH=CH— and —O—; wherein C_tH_{2t} represents (1) a valence bond or (2) alkylene of one to 10 carbon atoms, inclusivve, substituted with zero, one, or 2 fluoro, with one to 7 carbon atoms, inclusive, between —CR_3OH— and the ring; wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or -OR_9, wherein R_9 is hydrogen, alkyl of one to 4 carbon atoms, inclusive, or tetrahydropyranyl, and s is zero, one, 2, or 3, with the proviso that no more than two T are other than alkyl; and wherein ~indicates attachment of the group to the ring in alpha or beta configuration; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

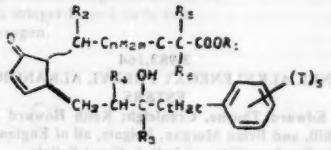
25. A compound of the formula:



wherein R_1 is hydrogen, alkyl of one to 8 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with 1, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive, or ethyl substituted in the β-position with 3 chloro, 2 or 3bromo, or 1, 2, or 3 iodo; wherein R_2, R_3, R_4, R_5, and R_6, are hydrogen or alkyl of one to 4 carbon atoms, inclusive; wherein C_pH_{2p} is alkylene of one to 8 carbon atoms, inclusive, with 1, 2, or 3 carbon atoms between —C C— and —O—; wherein C_tH_{2t} represents (1) a valence bond or (2) alkylene of one to 10 carbon atoms, inclusive, substituted with zero, one, or 2 fluoro, with one to 7 carbon atoms, inclusive, be-

tween $-CR_3OH-$ and the ring; wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $-OR_9$, wherein R_9 is hydrogen, alkyl of one to 4 carbon atoms, inclusive, or tetrahydropyranyl, and *s* is zero, one, 2, or 3, with the proviso that no more than two T are other than alkyl; and wherein ~ indicates attachment of the group to the ring in alpha or beta configuration; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

27. A compound of the formula:



wherein R_1 is hydrogen, alkyl of one to 8 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive, or ethyl substituted in the β-position with 3 chloro, 2 or 3 bromo, or 1, 2, or 3 iodo; wherein R_2, R_3, R_4, R_5, and R_6 are hydrogen or alkyl of one to 4 carbon atoms, inclusive; wherein C_nH_{2n} is alkylene of one to 10 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, between $-CH-R_2-$ and $-O-$; wherein C_tH_{2t} represents (1) a valence bond or (2) alkylene of one to 10 carbon atoms, inclusive, substituted with zero, one, or 2 fluoro, with one to 7 carbon atoms, inclusive, between $-CR_3OH-$ and the ring; wherein T is alkyl of one to 2 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $-OR_9$, wherein R_9 is hydrogen, alkyl of one to 4 carbon atoms, inclusive, or tetrahydropyranyl, and *s* is zero, 1, 2, or 3, with the proviso that no more than two T are other than alkyl; and wherein ~ indicates attachment of the group to the ring in alpha or beta configuration; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,983,159
PROCESS FOR PRODUCING BIPHENYLPOLYCARBOXYLIC ACID ESTER

Yataro Ichikawa, Iwakuni, Japan, and Teizo Yamaji, Potsdam, N.Y., assignors to Teijin Limited, Osaka, Japan

Division of Ser. No. 56,966, July 21, 1970, Pat. No. 3,857,874. This application Aug. 16, 1974, Ser. No. 498,182

Int. Cl.² C07C *67/00*

U.S. Cl. 260—473 R **8 Claims**

1. A process for producing biphenylpolycarboxylic acid esters which comprises contacting a benzenecarboxylic acid ester having 1 or 2 carboxylic acid ester groups having at least one hydrogen atom bonded to the nuclear carbon atom with molecular oxygen or a molecular oxygen-containing gas in liquid phase at a temperature of 110°– 250°C., under a partial pressure of molecular oxygen of 0.2 – 300 atmospheres and in the presence of a catalyst consisting essentially of at least one compound selected from at least one of the group consisting of salts of palladium which are aliphatic mono-carboxylates having 1 to 20 carbon atoms, alicyclic carboxylates, benzenecarboxylates, or naphthalenecarboxylates, and said catalyst being at least partially soluble in the reaction system.

3,983,160
PROCESS FOR THE PREPARATION OF HYDROXYPHENYLACETONITRILES

Horst Meyer, Wuppertal, Germany, assignor to Bayer Aktiengesellschaft, Germany

Filed Nov. 20, 1975, Ser. No. 633,683

Claims priority, application Germany, Dec. 3, 1974, 2457080

Int. Cl.² C07C *121/75*

U.S. Cl. 260—465 F **13 Claims**

1. Process for the preparation of an ortho or parahydroxyphenylacetonitrile of the formula:

wherein

R is ortho or parahydroxyphenyl, further unsubstituted or further substituted by one or two substituents independently selected from the group consisting of lower alkyl or lower alkoxy and

R^1 is hydrogen, lower alkyl, phenyl or carbon (lower alkoxy), which comprises allowing the corresponding ortho or parahydroxybenzyl alcohol of the formula:

to react with hydrogen cyanide in the presence of a diluent at a temperature of from about 80° to about 190°C.

3,983,161
OXIDATION OF UNSATURATED AMINES

John S. McConaghy, Jr., St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

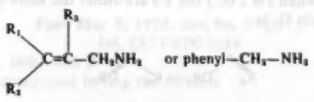
Filed Dec. 9, 1974, Ser. No. 530,925

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.² C07C *120/00*

U.S. Cl. 260—465.9 **12 Claims**

1. A process for the oxidation of an unsaturated amine having the formula



wherein R_1, R_2 and R_3 represent hydrogen or a C_1 to C_4 alkyl group, to the corresponding unsaturated nitrile which comprises reacting the amine with molecular oxygen in the presence of a solution in a nitrogen base which is not oxidized under the reaction conditions of;

a. a cuprous halide and

b. an alcoholic compound having the formula R—OH wherein R is an alkyl, aryl, alkaryl or aralkyl radical, in a halide to alcohol compound ratio of from 10:1 to 1:100, the reaction taking place at atmospheric or superatmospheric pressures and at a temperature of 0° to 200°C.

3,983,162

OPTICAL RESOLUTION OF ALKYL ESTERS OF DL-PHENYLALANINE

James M. Schlatter, Glenview, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed Jan. 2, 1975, Ser. No. 538,091
Int. Cl.[2] C07C 99/12
U.S. Cl. 260—471 A 4 Claims

1. In a process for the production of L-phenylalanine alkyl ester from the corresponding DL-phenylalanine alkyl ester by resolving with an N-acyl-D-phenylalanine, the improvement which comprises recrystallizing in an inert solvent the crude salt of N-acyl-D-phenylalanine and L-phenylalanine alkyl ester in the presence of the corresponding DL-phenylalanine alkyl ester of L-phenylalanine alkyl ester.

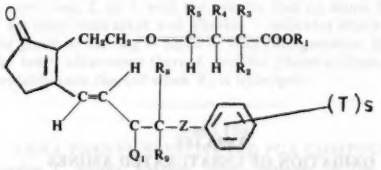
3,983,163

5-OXA PHENYL- AND PHENOXY-SUBSTITUTED PROSTAGLANDIN β, ANALOGS

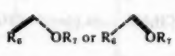
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 361,990, May 21, 1973, Pat. No. 3,864,387. This application Nov. 18, 1974, Ser. No. 524,413
Int. Cl.[2] C07C 69/76
U.S. Cl. 260—473 A 10 Claims

1. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of 1 to 9 carbon atoms, inclusive, substituted with 0, 1, or 2 fluoro, with one to 6 carbon atoms, inclusive, between $—CR_8R_9—$ and the ring; wherein T is alkyl of 1 to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $—OR_{10}$, wherein R_{10} is hydrogen or alkyl of 1 to 4 carbon atoms, inclusive, and *s* is 0, 1, 2, or 3, with the proviso that not more than two T's are other than alkyl and when *s* is 2 or 3 the T's are either the same or different; wherein Q_1 is



wherein R_6 and R_7 are hydrogen or alkyl of 1 to 4 carbon atoms, inclusive, being the same or different; wherein R_1 is hydrogen, alkyl) of 1 to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with 1, 2, or 3 chloro or alkyl or one to 4 carbon atoms, inclusive; wherein when Z is oxa (—O—), R_8 and R_9 are hydrogen or alkyl or one to 4 carbon atoms, being the same or different, and, when Z is C_jH_{2j}, R_8 and R_9 are hydrogen, alkyl of 1 to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that R_9 is fluoro only when R_8 is hydrogen or fluoro; wherein R_3 is hydrogen, alkyl of 1 to 4 carbon atoms, inclusive, or fluoro; wherein R_2 is hydrogen or fluoro, with the proviso that R_2 is fluoro only when R_3 is hydrogen or fluoro; and wherein R_4 and R_5 are hydrogen or alkyl of 1 to 4 carbon atoms, inclusive, being the same or different, with the proviso that no more than one of R_3, R_4, and R_5 is alkyl; including the lower alkanoates thereof, and the pharmacologically acceptables salts thereof when R_1 is hydrogen.

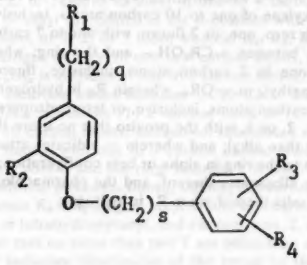
3,983,164

PHENYL ALKYLENEOXY PHENYL ALKANOIC ACID ESTERS

David Edward Thorne, Cranleigh; Keith Howard Baggaley, Redhill, and Brian Morgan, Reigate, all of England, assignors to Beecham Group Limited, Great Britain

Filed Aug. 5, 1974, Ser. No. 495,119
Claims priority, application United Kingdom, Aug. 23, 1973, 39902/73; Sept. 11, 1973, 42654/73; Mar. 26, 1974, 13911/74
Int. Cl.[2] C07C 69/88, 69/78
U.S. Cl. 260—473 R 22 Claims

1. A compound selected from the group consisting of a compound of the formula:



wherein:

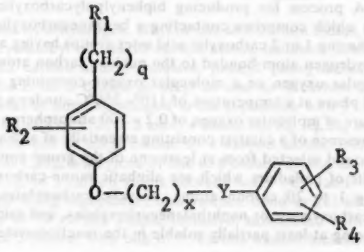
R_1 is carboxylic acid ester converted in the human body to a carboxylic acid group;

R_2 is hydrogen, lower alkyl or lower alkoxyl;

R_3 is hydrogen, halogen, lower alkyl or lower alkoxyl; p1 R_4 is hydrogen, halogen, phenyl, lower alkyl, lower alkoxyl, halo-lower alkyl, nitro, or a carboxylic ester group; or R_3 and R_4 together form the residue of a benzene ring;

q is zero or an integer from 1 to 12; and

s is an integer from 2 to 6; and a compound of the formula:



wherein:
R_1 is a carboxylic acid ester converted in the human body to a carboxylic acid group;
R_2 is hydrogen, lower alkyl or lower alkoxyl;
R_3 is hydrogen, halogen, lower alkyl or lower alkoxyl; and
R_4 is halogen, phenyl, lower alkyl, lower alkoxy, halo-lower alkyl, nitro or a carboxylic ester group; or R_3 is halogen, lower alkyl or lower alkoxyl; and R_4 is hydrogen, halogen, phenyl, lower alkyl, lower alkoxyl, halo-lower alkyl, nitro or a carboxylic ester group; or R_3 and R_4 together form the residue of a benzene ring;
q is zero or an integer from 1 to 12;
x is an integer from 1 to 6; and
Y is oxygen.

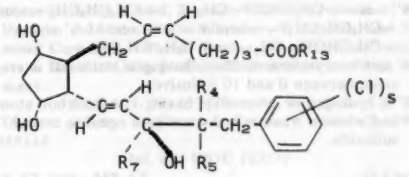
3,983,165

8β,12α,15β-17-PHENYL-18,19,20-TRINOR-PGF$_2\alpha$ COMPOUNDS

Ernest W. Yankee, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 374,405, June 28, 1973, which is a continuation-in-part of Ser. No. 289,317, Sept. 15, 1972, abandoned. This application Oct. 29, 1974, Ser. No. 518,693
Int. Cl.² C07C *65/13, 69/76*
U.S. Cl. 260—473 A **6 Claims**

1. An optically active compound of the formula



wherein
R_4, R_6, and R_7 are hydrogen or methyl, being the same or different;
wherein R_{13} is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; and
wherein s is zero, one 2, or 3; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_{13} is hydrogen.

3,983,166

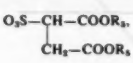
MONOMERIC EMULSION STABILIZERS

Carlos M. Samour, Wellesley Hills, Mass., assignor to The Kendall Company, Walpole, Mass.

Division of Ser. No. 452,073, March 18, 1974, Pat. No. 3,925,442, which is a continuation of Ser. No. 110,588, Jan. 28, 1971, which is a continuation-in-part of Ser. No. 769,355, Oct. 21, 1968, abandoned. This application Apr. 21, 1975, Ser. No. 569,781
Int. Cl.² C07C *67/16*
U.S. Cl. 260—481 R **3 Claims**

1. A monomeric emulsion stabilizer capable of stabilizing the polymerization of ethylenically-unsaturated monomers in a copolymerization reaction, corresponding to the formula:

wherein V is selected from the group consisting of 4-hydroxymaleoyloxy and;
4-hydroxycitraconoyloxy radicals;
A is an alkylene group selected from the class consisting of ethylene and propylene;
R_1, R_2 are methyl groups and R_3 is an acetamido group;
and $Y^- R_4$ is an acidic group selected from the class consisting of esters of sulfosuccinic acid,



wherein R_8 is an alkyl group of from 8 to 28 carbon atoms, and phenyl sulfonates wherein the phenyl group is substituted by an alkyl group of from 8 to 28 carbon atoms.

3,983,167

ACRYLATE AND METHACRYLATE MONOMERS

Daniel J. Najvar, and Jerry M. Hawkins, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 9, 1975, Ser. No. 576,071
Int. Cl.² C07C *9/54*
U.S. Cl. 260—486 R **10 Claims**

1. A compound having the formula

where
R is hydrogen, methyl or phenyl,
R_1 is hydrogen or methyl,
R_2 is an alkylene radical of 2 to about 4 carbons, and
R_3 is an alkyl of 1 to about 6 carbon atoms or cycloalkyl radical of 3 to about 6 carbons.

3,983,168

HALOPHENOXY BENZOIC ACID SALTS

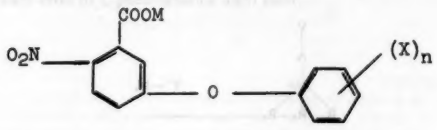
Robert J. Theissen, Westfield, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 387,829, Aug. 13, 1973, abandoned, which is a continuation-in-part of Ser. No. 334,527, Feb. 22, 1973, abandoned, which is a continuation-in-part of Ser. No. 194,480, Nov. 1, 1971, abandoned, which is a division of Ser. No. 819,412, April 25, 1969, Pat. No. 3,652,645. This application Sept. 4, 1975, Ser. No. 610,209

Int. Cl.² C07C *63/33*

U.S. Cl. 260—501.16 6 Claims

1. A compound having the formula:



wherein X is halogen, *n* is 1 to 5, and M is alkali metal (Li, Na, K), alkylammonium (C_1–C_4), or alkanolammonium (C_1–C_3).

3,983,169

PHENOXYPROPYLAMINE DERIVATIVES

Gerhard Zölss, Linz; Heribert Pittner, Gmund; Heimo Stormann-Menninger-Lerchenthal, and Irmgard Lindner, both of Linz, all of Austria, assignors to Chemie Linz Aktiengesellschaft, Austria

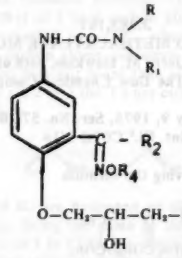
Filed Dec. 17, 1974, Ser. No. 533,689

Claims priority, application Austria, Dec. 21, 1973, 10718/73

Int. Cl.² C07C *87/52*, *111/00*

U.S. Cl. 260—501.17 7 Claims

1. A phenoxypropylamine derivatives selected from the group consisting of compounds of the formula:



wherein one or both of R and R_1 are hydrogen or lower alkyl R_2 is hydrogen or lower alkyl, R_3 is tertiary butyl or isopropyl and R_4 is hydrogen, alkyl containing from 1 to 6 carbon atoms or benzyl,

and pharmaceutically acceptable salts thereof.

6. A compound according to claim 1, N-[3-(1′-Hydroxyimino)-methyl-4-(3′-tert.-butylamino-2′-hydroxy)-propoxy]-phenyl-N′-dimethylurea.

3,983,170

PROCESS FOR THE PURIFICATION OF MALIC ACID

Shozo Sumikawa, Hofu; Rikichi Maida, and Yuriaki Kageyama, both of Ube, all of Japan, assignors to International Organics, Inc., Duluth, Minn. and Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan, part interest to each

Filed Dec. 6, 1974, Ser. No. 530,194

Int. Cl.² C07C *59/12*

U.S. Cl. 260—535 P 5 Claims

1. A process for the purification of D,L-malic acid which comprises a step of passing an aqueous malic acid solution containing maleic acid, fumaric acid or a mixture thereof as impurities through a column of a strongly basic anion exchange resin.

3,983,171

ANIONIC SURFACE ACTIVE COMPOSITIONS

Guy Vanlerberghe, Montjay-la-Tour, and Henri Sebag, Paris, both of France, assignors to L'Oreal, Paris, France

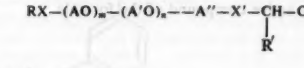
Division of Ser. No. 246,864, April 21, 1972, Pat. No. 3,822,346, which is a continuation of Ser. No. 749,580, Aug. 2, 1968, abandoned. This application Apr. 2, 1974, Ser. No. 457,354

Claims priority, application Luxemburg, Aug. 7, 1967, 54263

Int. Cl.² C07C *59/22*

U.S. Cl. 260—535 R 1 Claim

1. An anionic compound having surface-active properties and having the formula



wherein

R is alkyl or alkenyl having 8–22 carbon atoms;

X is oxygen;

X′ is oxygen, sulfur or sulfoxide;

A is ethylene, propylene or butylene;

A′ is $-C_2H_3(CH_2OH)-$ or $-CH_2-CHOH-CH_2-$;

A″ is $-CH_2CHOH-CH_2-$, $-CH_2CH_2CH_2-$ or $-CH_2CH(CH_3)-$ wherein at least one of A′ and A″ is $-CH_2CHOH-CH_2-$ or $-C_2H_3(CH_2OH)-$;

m and *n* represent numbers having a statistical average value between 0 and 10 inclusive;

R′ is hydrogen or lower alkyl having 1 to 2 carbon atoms; and wherein when *m* and *n* are both equal to zero, X′ is sulfoxide.

3,983,172

BIS-HALOGEN CARBONYL ANILINES AND PROCESS FOR THE PRODUCTION

Gerhard Büttner, Cologne; Erich Klauke, Odenthal-Hahnenberg, and Klaus Sasse, Schildgen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

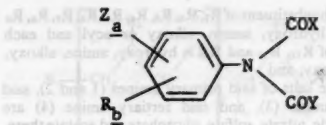
Filed Mar. 1, 1974, Ser. No. 447,438

Claims priority, application Germany, Mar. 9, 1973, 2311662

Int. Cl.² C07C *125/00*, *125/03*

U.S. Cl. 260—544 C 8 Claims

1. Process for preparing bis-halogen carbonyl anilines having the formula



wherein

X is fluorine or chlorine,

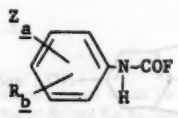
Y is fluorine, chlorine, fluorocarbonyl, or chlorocarbonyl,

Z is halogen, nitro, cyano, lower alkyl sulfonyl or carbalkoxy

R is lower alkyl, alkoxy, thioalkyl, phenyl, naphthyl, lower perhalogen alkyl, perhalogen alkoxy or perhalogen alkylthio,

a and *b* represent a number from 0 to 5, with the proviso that *a* plus *b* is at the most 5,

which comprises reacting an aryl carbamic acid fluoride having the formula



wherein

Z, R, *a*, *b* are as defined above with an acylating agent having the formula

wherein

X and Y are as defined above in the presence of a tertiary amine at a temperature in the range of from −20 to +40°C.

3,983,173

2-CARBOXAMIDO-SUBSTITUTED TETRACYCLINES AND PROCESS FOR THEIR MANUFACTURE

Herbert Hartung, Kriftel, Taunus; Walter Durckheimer, Hattersheim am Main; Elmar Schrinner, Wiesbaden, and Hermann Gerhards, Hofheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

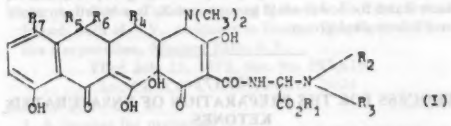
Filed Oct. 31, 1974, Ser. No. 519,843

Claims priority, application Germany, Nov. 3, 1973, 2355118

Int. Cl.² C07C *103/19*

U.S. Cl. 260—559 AT **25 Claims**

1. A 2-carboxamido-substituted tetracycline of the general formula I



(I)

in which R_1 is lower, optionally branched alkyl, R_2 and R_3 may be identical or different and each is hydrogen, optionally branched alkyl of 1 to 6 carbon atoms which may carry one or more identical or different substituents selected from the group consisting of hydroxy, lower dialkylamino, lower dialkylcarbamoyl, lower alkoxycarbonyl, phenyl, a heterocyclic group, especially a 5- or 6-membered ring which may include oxygen and/or nitrogen, and carboxyl, in this latter case the alkyl moiety may also carry amino; or cycloalkyl of 5 to 7 carbon atoms, and in which R_2 and R_3 may also be closed to form a saturated or unsaturated 5- or 6-membered ring which may include nitrogen or oxygen and may carry one or more substituents selected from the group consisting of lower alkyl, lower hydroxyalkyl, lower carboxyalkyl, hydroxyl or carboxyl, R_4 and R_5 may be identical or different and each is hydrogen or hydroxy, R_6 is hydrogen or methyl, R_5 and R_6 together are methylene, and R_7 is hydrogen, chlorine, bromine, dimethylamino or diethylamino.

25. A pharmaceutical composition having antibacterial activity which comprises an effective amount of a compound of formula I as the active substance.

3,983,174

DIALKYL ACETALS OF N-α-HALOCETYLANILINO ALDEHYDES

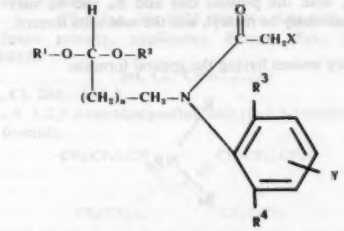
Sidney B. Richter, Chicago, and John Krenzer, Oak Park, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed May 28, 1974, Ser. No. 473,649

Int. Cl.² C07C *103/34*

U.S. Cl. 260—562 B **6 Claims**

1. A compound of the formula



wherein R^1, R^2 and R^3 are each lower alkyl; R^4 is selected from the group consisting of hydrogen, lower alkyl and lower alkoxy; Y is selected from the group consisting of hydrogen, lower alkyl and halogen; X is selected from the group consisting of chlorine and bromine and *n* is an integer from 0 to 1.

3,983,175

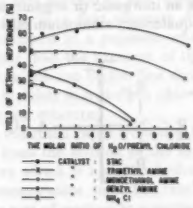
PROCESS FOR THE PRODUCTION OF A SUBSTITUTED KETONE

Yoshin Tamai; Takashi Nishida; Fumio Mori, all of Kurashiki; Yoshiaki Omura, Mitsu; Masahisa Tanomura, Kurashiki; Takeo Hosogai, Kiyone; Yoichi Ninagawa, and Kazuo Itoi, both of Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Continuation-in-part of Ser. No. 417,201, Nov. 19, 1973, abandoned. This application May 29, 1975, Ser. No. 581,841

Int. Cl.² C07C *45/00*

U.S. Cl. 260—586 R **23 Claims**



1. In a catalytic process for producing a substituted ketone by reacting an organic halide selected from the group consisting of alkyl halides, alkenyl halides, allyl halides, propargyl halides, cyclo alkyl halides and benzyl halides and a ketone having a replaceable hydrogen atom on the carbon atom

which is in the α-position to the carbonyl group thereof and selected from the group consisting of alkyl ketones, alkenyl ketones, cyclo alkenyl ketones, alicyclic ketones and aryl ketones, in the presence of a catalyst and an alkali metal hydroxide, the improvement which comprises said reaction being conducted in water, wherein the catalyst is selected from the group consisting of

1. Primary amines having the general formula:

$$R_1NH_2$$

wherein said R_1 is an unsubstituted or substituted alkyl group having at least 4 carbon atoms and the acid salts thereof;

2. primary amines having the general formula:

$$Z-(CH_2)_n-NH_2$$

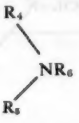
wherein Z is a hydroxyl group or an amino group and *n* represents the integer 2 or 3, and the acid salts thereof;

(3) secondary amines having the general formula:

$$R_2R_3NH$$

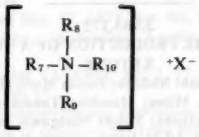
wherein said R_2 and R_3 each represents an unsubstituted or substituted alkyl group, a cycloalkyl group having at least 6 carbon atoms, or an aralkyl group having at least 7 carbon atoms, with the proviso that said R_2 and R_3 may not simultaneously be methyl, and the acid salts thereof;

(4) tertiary amines having the general formula:



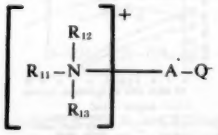
wherein said R_4, R_5 and R_6 each represents an unsubstituted or substituted alkyl group, a cycloalkyl group having at least 7 carbon atoms, with the proviso that said R_4, R_5 and R_6 may not simultaneously be methyl, and the acid salts thereof;

(5) quaternary ammonium salts having the general formula:



wherein said R_7, R_8, R_9 and R_{10} each represents a substituted or unsubstituted alkyl group, a cycloalkyl group having at least 6 carbon atoms, or an aralkyl group having at least 7 carbon atoms, with the proviso that said R_7, R_8, R_9 and R_{10} may not simultaneously be methyl, and the acid salts thereof, and wherein X^- is an inorganic or organic anion;

(6) betaine-type quaternary ammonium salts having the general formula:

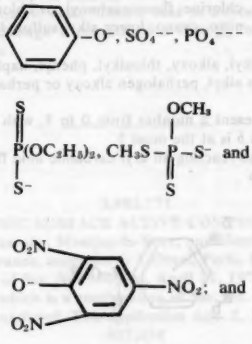


wherein said R_{11}, R_{12} and R_{13} each represents a substituted or unsubstituted alkyl group, with the proviso that said R_{11}, R_{12} and R_{13} may not simultaneously be methyl, —A— is an alkylene group and Q^- is $-SO_3^-$ or $-COO^-$; and

(7) mixtures thereof;

(i) wherein each substituent of R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, R_9 and R_{10} is hydroxy, amino, alkoxy or acyl and each substituent of R_{11}, R_{12} and R_{13} is hydroxy, amine, alkoxy, acyl or acyloxy; and

(ii) wherein the salts of said primary amines (1 and 2), said secondary amine (3), and said tertiary amine (4) are hydrochloride, nitrate, sulfate, phosphate and acetate thereof and the anion of said quaternary ammonium salts is selected from the group consisting of Cl^-, Br^-, I^-, OH^-, NO_3^-, ClO_4^-, SCN^-, CH_3COO^-,



(iii) wherein the molar ratio of water/organic halide is at least 2,5; and

(iv) wherein the molar ratio of alkali metal hydroxide/water is at least 0.3; and

(v) wherein the molar ratio of alkali metal hydroxide/organic halide is at least 2,0.

3,983,176

BENZOPHENONES PLANT AS GROWTH REGULANTS

Osamu Yamada; Akira Kurozumi; Shuichi Ishida; Fumio Futatsuya; Kensaku Ito, and Hiroshi Yamamoto, all of Ageo, Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

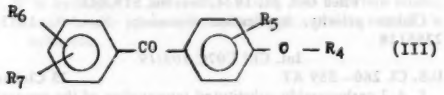
Division of Ser. No. 282,270, Aug. 21, 1972, Pat. No. 3,873,304. This application Nov. 14, 1974, Ser. No. 523,722

Claims priority, application Japan, Aug. 24, 1971, 46-64658

Int. Cl.[2] C07C *49/84*

U.S. Cl. 260—591 **2 Claims**

1. A compound of the general formula:



(III)

wherein R_4 is a lower alkyl group or allyl group. R_5 and R_6 each stand for lower alkyl groups and R_7 is a hydrogen atom or a lower alkyl group.

3,983,177

PROCESS FOR THE PREPARATION OF UNSATURATED KETONES

Charles Grard, Chaponost, France, assignor to Rhone-Poulenc S.A., Paris, France

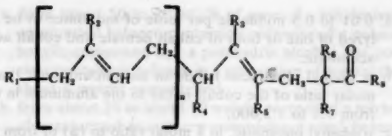
Filed June 23, 1972, Ser. No. 265,601

Claims priority, application France, June 24, 1971, 71.23063

Int. Cl.[2] C07C *49/20*

U.S. Cl. 260—593 R **14 Claims**

1. Process for the preparation of a ketone of the formula:



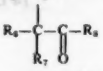
in which:

R_1 represents a hydrogen atom or a hydrocarbon group containing up to 10 carbon atoms each of R_2 and R_3, independently represents a hydrogen atom or an alkyl group of 1 to 4 carbon atoms,

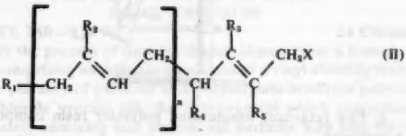
R_4 and R_5 represent hydrogen atoms or, together they form a divalent hydrocarbon group of the formula

$$-CH_2-CH_2-C(CH_3)_2-$$

each of R_6 and R_7, independently represents a hydrogen atom or a hydrocarbon group containing up to 10 carbon atoms, or R_6 and R_7 together with the carbon atom, to which they are attached, form a hydrocarbon ring of up to 10 carbon atoms, or the group



forms a hydrocarbon ring of up to 10 carbon atoms joined through R_6 and R_8, or R_7 and R_8, R_8 represents a hydrocarbon group containing up to 10 carbon atoms, and n is 0 or an integer of 1 to 6, wherein an unsaturated halide of the general formula:



(II)

in which X represents a bromine, chlorine or iodine atom and each of R_1, R_2, R_3, R_4 and R_5 is as defined above, is reacted at a reaction inducing temperature of −50° to +200°C with an ester of the enol form of a ketone, the ester being of the formula:

(III)

in which each of R_6, R_7 and R_8 is as defined above and R_9 represents a hydrocarbon group containing up to 20 carbon atoms, the hydrocarbon group being an alkyl, cycloalkyl or aryl group in the presence of a catalytically effective amount of a catalyst containing a metal from group 1b, 2b, 3b, including the actinide group, 4a, 4b, 5a, 6b, 7b or 8 of the Periodic classification.

3,983,178

IMMONIUM SALTS AND DERIVATIVES THEREOF

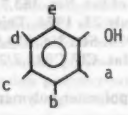
Victor A. Pattison, Tonawanda, and Russell L. K. Carr, Grand Island, both of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed July 21, 1975, Ser. No. 597,619

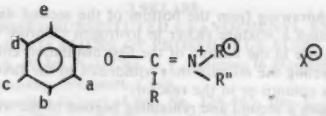
Int. Cl.² C07C *39/06, 39/26, 79/26*

U.S. Cl. 260—621 R **9 Claims**

1. A process for preparing



which comprises reacting



wherein at least one of the group a, b, c, d and e is α-haloalkyl and a, b, c, d and e are independently selected from the group consisting of hydrogen, hydrocarbyl, alkyl, α-haloalkyl, halogen and nitro; R is selected from the group consisting of hydrogen, alkyl and aryl; R′ and R″ are independently selected from the group consisting of hydrogen and alkyl, and X is selected from the group consisting of bromine, chlorine and fluorine; the alkyl, hydrocarbyl and α-haloalkyl groups being from one to thirty carbon atoms, and aryl is selected from the group phenyl and napthyl, with 0.1 to 100 times the stoichiometric proportion of GOH wherein G is alkyl of 1 to 6 carbon atoms at a temperature from ambient to reflux.

3,983,179

1,2,3,4 TETRAKIS-(PERFLUOROALKYL)-1,3-BUTADIENES

Jean Riess; Georges Santini, and Maurice Le Blanc, all of Nice, France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

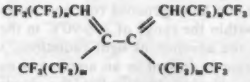
Filed Jan. 28, 1975, Ser. No. 544,817

Claims priority, application France, Feb. 12, 1974, 74.04599

Int. Cl.² C07C *21/20*

U.S. Cl. 260—653.3 **7 Claims**

1. A 1,2,3,4-tetrakis(perfluoroalkyl)-1,3-butadiene having the formula



wherein *n* and *m* are integers from 1 to 10 and $n = m$ or $n = m$.

3,983,180

PROCESS FOR PREPARING METHYL CHLORIDE

Kiichi Habata, Annaka; Shozo Tanaka, Osaka, and Hitoyuki Araki, Annaka, all of Japan, assignors to Shinetsu Chemical Company, Tokyo, Japan

Filed Oct. 2, 1974, Ser. No. 511,208

Claims priority, application Japan, Oct. 6, 1973, 48-112723

Int. Cl.² C07C *17/00*

U.S. Cl. 260—657 **3 Claims**

1. In a process for preparing methyl chloride by reacting a reaction mixture of hydrogen chloride with methanol in the absence of any catalysts in liquid phase, the improvement which consist essentially of:

a. reacting the reaction mixture in a reactor maintained at a pressure in the range from 1 to 3 kg/cm²G;

b. withdrawing a part of the reaction mixture from the reactor;

c. introducing a first portion of said withdrawn part of the reaction mixture to a first separate distillation column which is maintained at a pressure which is at least 0.1 kg/cm²G higher than the pressure of the reactor;

d. collecting from the top of the first distillation column a vapor which is richer in hydrogen chloride and methanol than the reaction mixture;

e. recycling the collected vapor from step (d) to the reactor;

f. withdrawing from the bottom of the first distillation column a mixture which is lower in hydrogen chloride and methanol concentration than the reaction mixture and introducing a part of mixture to a second separate distillation column which is maintained at a pressure from 10 to 500 mmHg absolute;

g. discharging from the top of the second distillation column water contained in the hydrogen chloride and methanol and water generated during the reaction;

h. withdrawing from the bottom of the second distillation column a mixture richer in hydrogen chloride than the mixture in the bottom of the first distillation column;

i. recycling the mixture thus withdrawn to the first distillation column or to the reactor;

j. passing a second and remaining portion of the withdrawn part from step (b) through an absorber and into the reactor while concurrently withdrawing methyl chloride formed in the reactor from its top and passing the methyl chloride through said absorber in counter current flow to said remaining portion to absorb the hydrogen chloride and methanol from the methyl chloride, and then collecting the methyl chloride.

3,983,181

PROCESS FOR THE CHLORINATION OF CHLORINATED ETHYLENE DERIVATIVES IN THE PRESENCE OF CHLORINATED ETHANE DERIVATIVES

Jean-Claude Strini, and Yves Correia, both of Saint-Auban, France, assignors to Produits Chimiques Pechiney-Saint Gobain, Neuilly-sur-Seine, France

Filed Dec. 23, 1969, Ser. No. 887,777

Claims priority, application France, Dec. 27, 1968, 68.181112

Int. Cl.² C07C *17/00*

U.S. Cl. 260—658 R **9 Claims**

1. A continuous process for chlorination of one or more dichloroethylenes and/or vinyl chloride in admixture with 1 to 80 mole% of one or more chloroethanes containing 1 to 5 chlorine atoms based on the total of the dichloroethylenes and/or vinyl chloride and the chloroethanes in liquid phase comprising passing the mixture with molecular chlorine through at least two homogeneous reaction zones in series at a temperature within the range of 20°–90°C in the absence of catalyst and in the absence of light radiations, wherein the molecular chlorine is present in an amount in each reaction zone to provide chlorine dissolved in the reaction medium within the range of 0.5 to 20 grams per liter.

3,983,182

ALKALI METAL ORGANIC COMPOUNDS AND THEIR METHOD OF PREPARATION

Richard J. Lagow, Manchester, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 286,261, Sept. 5, 1972, abandoned. This application Aug. 23, 1973, Ser. No. 391,035

Int. Cl.² C07F *1/02, 1/04, 1/00*

U.S. Cl. 260—665 R **33 Claims**

1. A process for forming an alkali metal organic compound which comprises contacting an organic reactant selected from the group consisting of carbon vapor and an organic compound having a carbon to hydrogen bond or a carbon to halogen bond with a vaporous alkali metal under dry conditions and in the substantial absence of a gas that reacts with the alkali metal other than the organic reactant, said alkali metal having sufficient energy to react with the carbon vapor or to break at least one of said bonds.

3,983,183

PRODUCTION OF HIGH-VINYL GROUP, LOW-MOLECULAR WEIGHT UNSATURATED HYDROCARBON POLYMERS

Wolfgang Kampf, Haltern, Germany, assignor to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Filed Dec. 9, 1974, Ser. No. 530,549

Claims priority, application Germany, Dec. 12, 1973, 2361782

Int. Cl.² C08F *4/70, 36/06*

U.S. Cl. 260—680 B **10 Claims**

1. A process for the production of low molecular weight butadiene polymers having a molecular weight distribution of between 1 and 1.5 and whose double bonds are 10–70% vinyl, 30—90% 1,4-cis and 0–10% 1,4-trans, by the polymerization of butadiene, in bulk or in the presence of a solvent, which comprises employing as the catalyst system:

a. 0.01 to 0.5 millimole per mole of monomer to be catalyzed of one or both of cobalt octoate and cobalt acetylacetonate;

b. a dialkyl aluminum halide in an amount such that the molar ratio of the cobalt in (a) to the aluminum in (b) is from 1:1 to 1:2,000;

c. triphenyl phosphite, in a molar ratio to (a) of from 0.3:1 to 10:1; and

d. an H-acidic compound in a molar ratio to the aluminum in (b) of up to 1.5:1.

3,983,184

UNSATURATED POLYESTER RESIN COMPOSITION

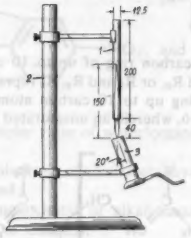
Kenji Kikuzawa, Ooimachi; Kiichiro Sasaguri, Tokyo; Yasuyoshi Oda, Iwaki; Hiroshi Sano, Iwaki, and Katsumi Okina, Iwaki, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 368,020, June 8, 1973, abandoned. This application Dec. 30, 1974, Ser. No. 537,406

Claims priority, application Japan, June 14, 1972, 47-58545

Int. Cl.² C08L *63/10, 67/06*

U.S. Cl. 260—837 R **14 Claims**



1. Fire retardant unsaturated polyester resin composition comprising:

1. 100 parts by weight of unsaturated polyester resin which is the reaction product of a mixture containing

a. 80% – 30% by weight of unsaturated polyester prepolymer prepared by condensation of at least one dicarboxylic acid, at least one glycol and at least one unsaturated dicarboxylic acid; or the reaction product of an epoxy compound having at least two 1,2 epoxy groups and a compound of the formula:

$$CH_2{=}\underset{R_1}{CH}\ COO\ R_2$$

wherein R_1 is hydrogen or lower alkyl and R_2 is hydrogen or lower alkyl;

b. 20% – 70% by weight of at least one vinyl compound; and

2. 100 – 900 parts by weight of hydrated magnesium carbonate represented by a general formula $MgCO_3$, nH_2O(n=3 or 5).

3,983,185

HALOGEN CONTAINING POLYESTER RESINS HAVING IMPROVED SMOKE-RESISTANCE

Edwin Dorfman, Grand Island; Raymond R. Hindersinn, Lewiston, and Willis T. Schwartz, Jr., Grand Island, all of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. Nos. 383,749, July 30, 1973, and Ser. No. 490,423, July 22, 1974. This application Oct. 15, 1974, Ser. No. 514,984

Int. Cl.² C08J *3/20*

U.S. Cl. 260—863 **46 Claims**

1. A fire retardant polyester polymer composition comprising

1. a mixture copolymerizable to an infusible resin consisting essentially of

a. from about 50 to 80 wt. % of an α, β - ethylenically unsaturated halogen-containing polyester of a polycarboxylic compound and a polyhydric alcohol, the polyester containing halogen in a proportion of greater than about 4 weight percent; and

b. from about 20 to about 50 weight percent of a mixture of unsaturated monomers comprising a vinyl benzene compound and an acrylic compound selected from the group consisting of acrylic acid, methacrylic acid and esters thereof, the weight ratio of vinyl benzene compound to acrylic compound being about 1:4 to 4:1; and

2. an effective fire retardant proportion of about 0.5 to about 10 weight percent of a smoke inhibiting additive consisting essentially of at least 0.5 weight percent of a compound of iron or a mixture of said iron compound with a compound of copper and/or a compound of antimony with the proviso that when said additive is a compound of iron that is soluble in said polyester, the compound of iron is free of iron-to-carbon bonds, said composition being substantially phosphorous-free and said proportions and weight percents being based on the weight of the copolymerizable mixture.

3,983,186
PROCESS FOR PREPARING RIGID PVC FORMULATIONS

Kenneth L. Ellers, Irvington, N.Y., and Adam F. Kopacki, Westwood, N.J., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Aug. 4, 1971, Ser. No. 169,049
Int. Cl.² C08L *51/00*
U.S. Cl. 260—876 R **24 Claims**

1. In the process of forming shaped objects from a formulation comprising an intimate admixture of a vinyl chloride resin and a plurality of particles of a polyacrylate-modified polyvinyl chloride process aid, the improvement which comprises intimately admixing said process aid particles with said vinyl chloride resin at a temperature in the range of from about 70° to 150°F. after first raising the temperature of said vinyl chloride resin to within the range of from about 180° to 250°F. by subjecting it to mechanical agitation; the particles of said polyacrylate-modified polyvinyl chloride process aid comprising particles of polyvinyl chloride having polyacrylate ester moieties polymerized in and/or on said particles, said polyacrylate ester moieties being selected from the group consisting of polymethyl methacrylate and copolymers of methyl methacrylate with up to about 20%, by weight, of at least one ethylenically unsaturated comonomer; said polyacrylate ester moieties being present in a concentration of from about 10 to 60% as based on the weight of the polyvinyl chloride moieties of said particles.

3,983,187
IODINE MOLECULAR WEIGHT REGULATORS IN SUSPENSION POLYMERIZATION SYSTEMS

George A. Moczygemba; W. Delmar Johnson, and Earl Clark, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 303,330, Nov. 3, 1972, abandoned. This application Sept. 27, 1974, Ser. No. 510,040
Int. Cl.² C08L *9/00, 9/02, 9/06*
U.S. Cl. 260—880 R **13 Claims**

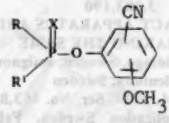
1. In an aqueous suspension graft co-polymerization system wherein at least one polymerizable monomer selected from the group consisting of monovinyl-substituted aromatic compounds, alpha, beta-unsaturated nitriles, esters of acrylic acid, esters of alkacrylic acid, and vinyl esters, is graft polymerized with at least one elastomeric polymer of a conjugated diene under aqueous suspension polymerization conditions in the presence of a molecular weight modifier, the improvement which comprises the step of employing elemental iodine as said molecular weight modifier.

3,983,188
METHOXY-SUBSTITUTED CYANOPHENYL ESTER DERIVATIVES OF PHOSPHORUS ACIDS

Edward N. Walsh, New City, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 328,463, Dec. 6, 1963, abandoned. This application Apr. 21, 1967, Ser. No. 632,523
Int. Cl.² C07F *9/12, 9/18, 9/32, 9/40*
U.S. Cl. 260—940 **17 Claims**

1. A compound having the formula:

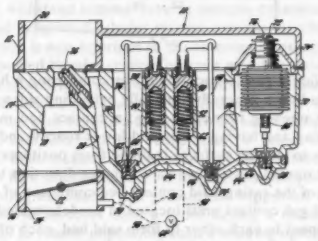


where R and R^1 are members independently selected from the group consisting of lower alkyl, chloro-substituted lower alkyl, lower alkoxy, phenyl, and phenoxy; and X is a member selected from the group consisting of oxygen and sulfur.

3,983,189
CARBURETOR

Roland S. Taylor, Fairport, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 21, 1974, Ser. No. 499,332
Int. Cl.² F02M *7/16*
U.S. Cl. 261—23 A **4 Claims**



1. A carburetor comprising a fuel bowl, first and second air induction passages disposed on opposite sides of said bowl, each of said passages having a venturi disposed therein, throttle means disposed in said induction passages for controlling air flow therethrough, first and second fuel passages extending to said venturis respectively whereby fuel may be delivered thereto and mixed with air therein, first and second main metering orifices opening from opposite sides of said bowl to said first and second passages respectively, first and second main metering rods controlling fuel flow through said first and second orifices respectively, a main piston disposed between said orifices and connected to said metering rods, an auxiliary fuel passage extending beneath said piston, auxiliary and supplementary metering orifices opening from said bowl to said auxiliary passage, auxiliary and supplementary metering rods disposed in and controlling fuel flow through said auxiliary and supplementary orifices respectively, an auxiliary piston disposed adjacent said main piston and connected to said auxiliary rod, passage means for subjecting said pistons to the pressure in at least one of said induction passages downstream of said throttle means whereby said main piston may cause said main rods to restrict fuel flow through said main orifices and said auxiliary piston may cause said auxiliary rod to restrict fuel flow through said auxiliary orifice in response to decreases in said pressure below selected values, springs biasing said main and auxiliary pistons and rods to permit increased flow through said main and auxiliary orifices, a bellows connected to said supplementary rod and exposed to the ambient pressure whereby said bellows may cause said

supplementary rod to restrict fuel flow through said supplementary orifice upon a decrease in ambient pressure and to permit increased fuel flow through said supplementary orifice upon an increase in ambient pressure, and first and second transfer passages extending from said auxiliary passage beneath said main piston to said first and second fuel passages beneath said first and second orifices respectively whereby fuel flow through said auxiliary and supplementary orifices may be appropriately divided between and delivered to said venturis.

3,983,190

LIQUID-GAS CONTACT APPARATUS AND METHOD FOR MAKING THE SAME

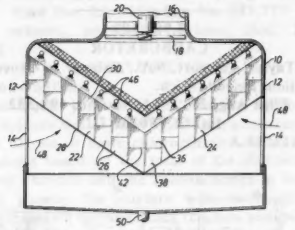
Per Gunnar Norbäck, Lidingo, Sweden, assignor to Aktiebolaget Carl Munters, Sollentuna, Sweden

Filed Apr. 24, 1974, Ser. No. 463,828

Claims priority, application Sweden, Feb. 22, 1974, 7402409

Int. Cl.² B01F *3/04*; B32B *31/18*

U.S. Cl. 261—111 **9 Claims**



1. A liquid-gas contact apparatus comprising a hollow casing including a generally vertically extending sidewall and an air inlet opening formed therein; a contact bed mounted in said casing and having upper and lower spaced and generally parallely extending surfaces inclined from positions above the air inlet opening in a downward angular direction toward the interior of the casing; said contact bed composed of a plurality of liquid-gas contact units located in predetermined positions with respect to each other to form said bed; each of said units being formed from a plurality of interconnected layers of sheet material, at least some of which are formed of corrugated sheet material to define a plurality of liquid gas passageways between adjacent layers; said units being positioned in said casing with said layers of sheet material and the passageways between adjacent layers lying in vertical planes extending parallel to the plane of said inlet opening and vertical sidewall; said units each having upper and lower spaced parallely extending surfaces inclined in a downward angular direction from the casing sidewall toward the interior of the casing across said sheets, and being displaced downwardly relative to one another towards the interior of the casing with their upper and lower surfaces substantially in alignment to provide the upper and lower surfaces of said contact bed; and said contact units having a generally rhomboid peripheral configuration when viewed in section transversely of the layers thereof with said rectangular sides forming a pair of vertical parallel sides of the rhomboid.

3,983,191

BRAZED PLATE-TYPE HEAT EXCHANGER FOR NONADIABATIC RECTIFICATION

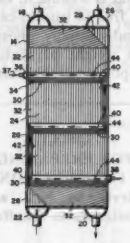
James J. Schauls, La Crosse, Wis., assignor to The Trane Company, La Crosse, Wis.

Filed Nov. 10, 1975, Ser. No. 630,284

Int. Cl.² B01F *3/04*

U.S. Cl. 261—114 R **12 Claims**

1. A plate-type heat exchanger comprising: a plurality of elongated vertically extending sheet-like metallic plates of generally similar configuration in side-by-side, spaced, face-to-face parallel relationship; metallic sealing means for sealingly connecting adjacent plates along their margins whereby a vertical passageway is defined between each pair of said adjacent plates, certain first passageways for a first heat exchange fluid being interleaved with other second passageways for a second gaseous heat exchange fluid for heat transfer therebetween by heat conduction through said plates; each of said first and second passageways containing a metallic corrugated fin packing braze bonded on opposite sides to and extending between the faces of said adjacent plates whereby said adjacent plates are structurally connected by said fin packing and whereby said fin packing conducts heat between said passageways and said plates; flow director means associated with each of said second passageways for directing a liquid in a descending serpentine flow path having a plurality of substantially horizontal legs disposed at progressively descending levels and each crossing horizontally at least a portion of said associated second passageway; said horizontal legs of said



serpentine flow path being in substantially open fluid communication with said associated second passageway; said horizontal legs being in fluid communication with each other by downcomers and at least one of said horizontal legs being in fluid communication at one end to a substantially horizontal leg above and at the other end to a substantially horizontal leg below said one leg by said downcomers whereby liquid passing in said serpentine flow path may traverse said associated second passageway several times to become in part contacted with the gas flowing in said associated second passageway and that liquid flowing in said second associated passageway in a direction opposite to the gas flow therein may be removed by passing into said serpentine flow path at one elevation and recontacted with the gas flowing in said second associated passageway at a lower elevation to thereby establish a stable reflux of the fluids within said second associated passageway.

3,983,192

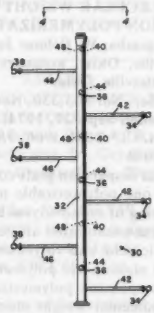
WATER COOLING ARRANGEMENT

Robert J. Stoker, Phillipsburg, N.J., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Apr. 9, 1975, Ser. No. 566,267

Int. Cl.² B01F *3/04*

U.S. Cl. 261—115 **4 Claims**



1. In an arrangement for cooling large quantities of water, a vertical water pipe; a plurality of vertically spaced water

nozzles mounted on the water pipe with each water nozzle being circumferentially spaced from each adjacent water nozzle, by an approximate 90° angle in a manner such that a line interconnecting the nozzles would be a spiral, the water exits of all of the nozzles being unobstructed and facing the same general direction to direct the flow of water in the same general translational direction.

3,983,193

METHOD OF RETREADING PNEUMATIC TIRES

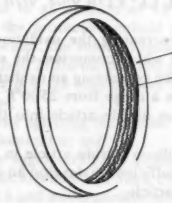
Jan-Eric Lennart Wulker, Traslovslage, and Gote Bertil Sivert Bohman, Varberg, both of Sweden, assignors to DACAPO AB, Varberg, Sweden

Filed May 1, 1974, Ser. No. 465,878

Claims priority, application Sweden, Apr. 10, 1974, 7448356; Nov. 12, 1973, 73152639

Int. Cl.² B29H 5/04

U.S. Cl. 264—36 13 Claims



1. A method of treading tires in which a vulcanizable camelback tread band is placed on the tread receiving surface of a tire body, said band being made of a material which has a predetermined vulcanizing temperature and which becomes plastic during vulcanization thereof, and in which a peripherally continuous, stretchable, matrix ring mold having an internal, embossing, negative tread pattern is contacted with said band to form said tread pattern thereon, said tread pattern, when said mold is unstretched, having a predetermined normal inner diameter and said mold being made of an elastic material which substantially maintains its elasticity and physical form at least at temperatures up to said vulcanizing temperature, said method comprising the steps of:

a. placing said camelback tread band on and in contact with the tread receiving surface of a tire body, said tread band having a radial thickness such that the outer diameter thereof when placed on said tire body is greater than said normal inner diameter of said tread pattern;

b. increasing said inner diameter of said tread pattern to a size at least equal to said outer diameter of said band by stretching and expanding said mold and placing said mold over said tread band on said tire body, the elasticity of said elastic material being sufficient to permit said stretching of said mold without exceeding the elastic limit thereof, whereby said tread pattern is urged by elastic tension to contract until it reassumes said normal inner diameter after the stretching force thereon is terminated;

c. allowing the expanded matrix ring mold to contract responsive to said elastic tension, at least until said pattern contacts the exterior surface of said tread band on the tire body; and

d. heating the matrix ring mold, tire body and tread band to a temperature which converts the tread band into a plastic form and thereby permits said mold to further contract and emboss the tread pattern of the matrix ring mold onto the tread band, and which vulcanizes the tread band onto the tire body.

3,983,194

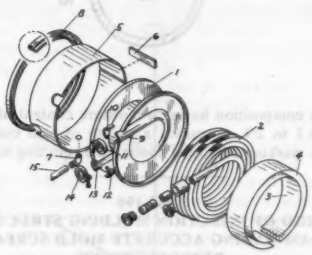
PROCESS FOR MANUFACTURING A HELICAL REVERSE OSMOSIS SEGMENT

John L. Richardson, Birmingham, Mich.; Gilbert Segovia, Santa Ana, and Clarke H. Lewis, Fountain Valley, both of Calif., assignors to Oxy Metal Industries Corporation, Warren, Mich.

Filed July 13, 1971, Ser. No. 162,247

Int. Cl.² B01D 31/00, 13/00

U.S. Cl. 264—41 4 Claims



1. The process of producing a rugged, compact and readily portable reverse osmosis module comprising producing an unsupported reverse osmosis tubular member, applying to the exterior of such tubular reverse osmosis member a fibrous supporting member to enable the tubular reverse osmosis member to withstand internal reverse osmosis pressures, pressurizing said supported tubular reverse osmosis member with a liquid which is non-injurious to the reverse osmosis qualities of the supported tubular reverse osmosis member, said liquid being maintained at a sufficiently elevated temperature and pressure to enable the supported tubular reverse osmosis member to be bent around a comparatively small radius without injury, said temperature being below a value which is capable of heat treating the reverse osmosis membrane to reduce the flow characteristics of the reverse osmosis membrane, winding the heated and pressurized supported tubular reverse osmosis member onto a spool having a radius sufficiently small to render impossible such a winding operation in the absence of the heated pressurizing liquid, removing the heated pressuring liquid without creating within the supported tubular reverse osmosis member any negative pressure, and replacing the pressurized heated liquid with a liquid which is non-injurious to the reverse osmosis qualities of the spooled supported tubular reverse osmosis member, said liquid being under substantial pressure of at least about 90 psig to improve the contact between the exterior of the tubular reverse osmosis member and the supporting fibrous member and being heated to a temperature sufficient to establish the desired reverse osmosis qualities in the spooled supported tubular reverse osmosis member.

3,983,195

PENCIL SHEATH COMPOSITIONS, METHOD FOR MAKING PENCILS

Irving J. Arons, Peabody; Robert Eller, Boston, and Richard E. Merrill, Wakefield, all of Mass., assignors to Hasbro Industries, Inc., Pawtucket, R.I.

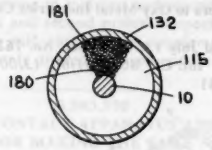
Division of Ser. No. 348,664, April 6, 1973, Pat. No. 3,875,088, which is a continuation-in-part of Ser. No. 163,303, July 16, 1971, abandoned. This application Oct. 29, 1974, Ser. No. 518,879

Int. Cl.² B29D 27/00; B29F 3/10; B43K 19/14

U.S. Cl. 264—45.3 7 Claims

1. A method of making a sheathed marking core wherein the sheath is cellular comprising providing a composition consisting essentially of, by weight, approximately 50 to 75% of an extrusion grade thermoplastic resin binder having a Vicat softening point above about 180°F, approximately 20 to

40% of a fibrous filler selected from the group consisting of cellulose and leather, the binder/filler ratio being approximately 1.5 to 3.0, and approximately 0.5 to 15% of a metallic



soap, the composition having a moisture content of approximately 0.3 to 2%, extruding a sheath of said composition around a marking core, and cooling the resulting extrudate.

3,983,196

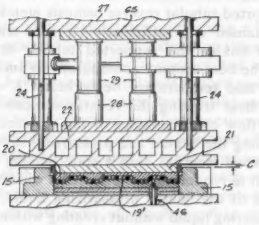
METHOD OF INJECTION MOLDING STRUCTURAL FOAM HAVING ACCURATE MOLD SURFACE REPRODUCTIONS

Charles H. Gray, Port Lambton, Canada, assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 234,028, March 13, 1972, abandoned. This application July 18, 1974, Ser. No. 489,676

Int. Cl.² B29D *27/00;* **B29F** *1/06*

U.S. Cl. 264—45.5 **6 Claims**



1. A method for manufacturing a foam plastic product by injection molding of a heat plastified synthetic resinous thermoplastic material employing a mold, the mold having members being supported on platens, the platens are movably positioned relative to each other and the mold members are closable to define a mold cavity by selectively positioning the platens, the mold cavity being adjustable by movement of the platens supporting the mold members to define a cavity of lesser volume or a cavity of greater volume, the steps of the method comprising

closing the mold to form the cavity of greater volume,

injecting into said cavity having a volume at least adjustable to define said cavity of greater volume from a means to supply a heat plastified synthetic resinous composition which foams under atmospheric pressure, a heat plastified synthetic resinous composition to fill said sufficient quantity of said mold cavity of greater volume upon foaming with said foamed synthetic resinous composition,

positioning at least one of the platens to form the mold cavity of lesser volume while the synthetic resinous composition is still in thermoplastic deformable state to compress the composition, cooling the composition within the mold and subsequently removing a cooled rigid composition from the mold to thereby provide a molded foam plastic article that more accurately reproduces the mold surface than is possible without compressing during molding.

3,983,197

PREPARATION OF ALUMINA EXTRUDATES

Roy T. Mitsche, Island Lake; Hillard L. Kuntz, Mount Prospect, and John C. Hayes, Palatine, all of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Sept. 24, 1973, Ser. No. 400,292

Int. Cl.² C04B *33/32;* **B28B** *3/20*

U.S. Cl. 264—56 **4 Claims**

1. A method of preparing alumina extrudate particles which comprises:

a. forming a mixture consisting essentially of a finely divided alumina and from about 2 to about 10 wt. % alumina hydrosol, and adding sufficient water thereto to produce a dough extrudable at less than about 150 psig.;

b. extruding the resulting dough; and

c. drying and calcining the extrudate.

3,983,198

METHOD OF INCREASING THE OXIDATION RESISTANCE OF SILICON NITRIDE

John A. Mangels, Allen Park, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Feb. 12, 1975, Ser. No. 549,415

Int. Cl.² F27B *9/04, 9/10*

U.S. Cl. 264—65 **5 Claims**

1. A method of increasing the oxidation resistance of a silicon nitride article which comprises the steps of:

preheating a furnace containing an oxidizing atmosphere to a temperature in a range from 2500°F to 2750°F;

inserting the silicon nitride article into the preheated furnace; and

maintaining the silicon nitride article in the furnace for a period of time sufficient to develop an oxidation resistant surface on the article.

3,983,199

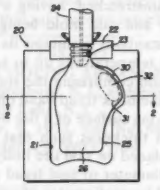
METHOD FOR MAKING PLASTIC ARTICLES HAVING BLOWN AND NON-BLOWN PORTIONS

Albert R. Uhlig, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Oct. 15, 1974, Ser. No. 514,830

Int. Cl.² B29C *17/07, 17/12*

U.S. Cl. 264—89 **8 Claims**



1. In a method of making a blown plastic article having contiguous non-blown and blown portions, the non-blown portion being surrounded by the blown portion, the steps of (1) forming a blowable shape including an indentation, (2) positioning the blowable shape between the open sections of a closable blow mold, (3) closing the blow mold sections on said blowable shape, (a) initial closing movement of said mold sections locally engaging the indentation in the blowable shape with pinching projections on the mold sections, chilling the engaged portion to secure that portion to the pinching projections, and deflecting the indentation and (b) further joint closing movement of said mold sections and said blowable shape engaging and pinching shut the remainder of the blowable shape portion which will become the non-blown portion, and (4) blowing the blowable shape to the blown portions of the article interiorly of said mold in contiguous relation to the pinched-shut, non-blown portion.

3,983,200

METHOD FOR THE PRODUCTION OF POLYTETRAFLUOROETHYLENE MOULDING POWDERS

Howard Edmund Browning, Welwyn, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 205,657, Dec. 7, 1971, abandoned. This application May 28, 1974, Ser. No. 473,913

Claims priority, application United Kingdom, Dec. 11, 1970, 59016/70; July 26, 1971, 34950/71

Int. Cl.² B01J 2/10

U.S. Cl. 264—117 9 Claims

1. A process for the preparation of a free-flowing product selected from the group consisting of filled and unfilled agglomerated products,

from a composition selected from the group consisting of granular polytetrafluoroethylene powders and mixtures of granular polytetrafluoroethylene powder with filler powder, the polytetrafluoroethylene particles in said composition having an air sedimentation size of less than 100 μm,

said method comprising the steps of:

i. wetting said composition with an aqueous solution of a protective colloid, the solution containing the protective colloid in an amount of 10 to 10,000 parts by weight of the protective colloid per million parts by weight of water, the solution being used in an amount from $21.5/\alpha$ to $215/\alpha$ ml. per 100 gms. of said composition, where α is the true density in gms. cm^{-3} of said composition;

ii. mechanically agitating the wetted composition to form it into agglomerates; and

iii. drying the agglomerates to produce an agglomerated product which, when dry, has a compacted flow rating of at least 16 and a compaction ratio of less than 433.

3,983,201

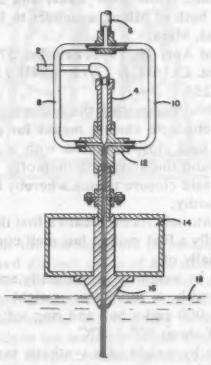
METHOD OF PREPARING A LACQUER COATED REGENERATED CELLULOSE FILM WITH AN INTERMEDIATE LAYER OF HYDROXYALKYL CELLULOSE

John S. Taylor, Newark, Del., assignor to FMC Corporation, Philadelphia, Pa.

Filed June 9, 1972, Ser. No. 261,490

Int. Cl.² B29D 7/04, 7/20

U.S. Cl. 264—129 10 Claims



1. A method of preparing a composite film which comprises extruding a layer of a film-forming viscose solution with a layer of an aqueous caustic solution of an alkali-soluble, water-insoluble hydroxyalkyl cellulose contiguous to each surface of said viscose layer into a coagulating medium for each solution, drying the resulting composite sheet, coating the hydroxyalkyl cellulose layer with a volatile organic solvent solution of a thermoplastic film-forming resin, and drying the coating.

3,983,202

MANUFACTURE OF SYNTHETIC FIBERS AND YARNS

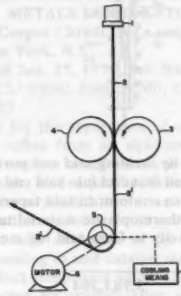
Wladyslaw H. Skoroszewski, Manchester, England, assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 48,231, June 22, 1970, abandoned. This application Nov. 10, 1972, Ser. No. 305,625

Claims priority, application United Kingdom, June 26, 1969, 32365/69

Int. Cl.² B29H 7/18

U.S. Cl. 264—147 3 Claims



1. In the process for the manufacture of synthetic fibers of regular dimension and substantially free from whiskers which comprises bringing a sheet-like mass of a molecularly-orientable thermoplastic material at a temperature above its crystalline melting point into pressure contact with a profiling element to form a profiled polymer web having a plurality of longitudinal grooves disposed in close but spaced apart relationship in at least one surface thereof, said profiling element having a plurality of closely spaced, parallel, surface ridges each having inwardly directed sides leading to a peak, chilling the profiled web and stretching to effect orientation thereof, and subjecting the profiled molecularly oriented web to a controlled fibrillation to form said synthetic fibers, the improvement which comprises contacting the ungrooved surface of the profiled web while above its crystalline melting point with a chill roller which is drivably mounted in a position below the profiling element such that the profiled web travels substantially vertically downwards to impinge tangentially on the roller surface, thereby chilling the profiled web to a temperature below the melting point of the polymer, while at the same time imparting a drawing movement to the web parallel with the direction of extrusion between the profiling element and the chill roller, thereby subjecting the web to a melt draw-down parallel to the direction of extrusion and reducing the cross-sectional area of the profile web.

3,983,203

METHOD OF MAKING A CATHETER WITH AN INTEGRAL LUER LOCK MEANS

Joseph H. Corbett, Glens Falls, N.Y., assignor to Sherwood Medical Industries Inc., St. Louis, Mo.

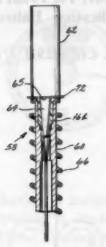
Filed Nov. 16, 1973, Ser. No. 416,722

Int. Cl.² B29C 17/14; B29D 23/04; B29F 3/00, 5/00

U.S. Cl. 264—150 6 Claims

1. A method of making a single piece plastic catheter having, at one end of the catheter, an integrally formed Luer lock connector having radially outwardly extending lug means thereon, and a tapered bore with walls tapering radially inwardly toward the opposite end of the catheter, for connection with complementary Luer lock connecting means of another member comprising the steps of extruding thermoplastic tubing having a first portion and a second portion integral with said first portion and axially disposed therefrom, said second portion having a smaller outer diameter than said first portion and a wall thickness less than that of said first portion, whereby said second portion is more flexible than said first portion; cutting said tubing to provide a tube of

selected length which includes at least a part of each of said first and second portions with a part of said first portion at one end of the tube; inserting an end portion of said tube having a part of said first portion in a mold having an axially extending cavity and a radially extending cavity at one end of said



axially extending cavity, heating said end portion of said tube and inserting a tapered mandrel into said end portion, reshaping said end portion to conform to said tapered mandrel, and causing some of the thermoplastic material to move into said radially extending cavity to form said lug means on said end portion.

3,983,204

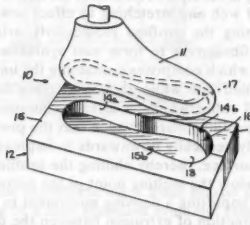
RECESSED LAST AND METHOD OF LASTING AND MOLDING A SHOE SOLE TO UPPER INCLUDING POSITIONING INSOLE IN RECESSED LAST

Jerome L. Opinsky, Joppatowne, Md., and Ralph D. Stewart, Naugatuck, Conn., assignors to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 812,832, April 2, 1969, abandoned. This application July 14, 1971, Ser. No. 162,508

Int. Cl. B29f *1/00*

U.S. Cl. 264—244 **11 Claims**



1. A process of making an article of footwear comprising:

positioning a last with its sole-surface facing upwardly;

placing an insole into a correspondingly contoured and dimensioned recess provided at the sole-surface of the last, said recess defining a wall surrounding the peripheral edge of the insole for peripherally engaging the insole so as to prevent lateral movement of said insole with respect to said last;

positioning an upper on said last with the sole-engaging margin of the lasted upper extending inwardly beyond the walls of said recess into overlying relation with the margin of said insole;

inverting the lasted upper so that its sole-surface faces downwardly, said insole being retained in said recess solely by said sole-engaging margin of said upper and accurately located with respect to said upper by the peripheral engagement with the wall of said recess;

placing the lasted upper and retained insole into a mold cavity with the insole facing downwardly, and

forming in said mold cavity an outsole adhering both to said insole and to the bottom of said lasted upper, said step of forming the outsole comprising molding an outsole to said upper and to said insole in said mold cavity while peripherally engaging and positively locating the insole relative to the lasted upper during the molding operation without the need for additional fastening means.

3,983,205

METHOD OF MOLDING REINFORCED ARTICLES

Joseph Edward Barrett, Twickenham, England, assignor to The British Petroleum Company Limited, England

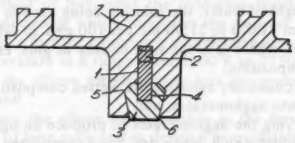
Continuation of Ser. No. 274,315, July 24, 1972, abandoned. This application May 16, 1974, Ser. No. 470,375

Claims priority, application United Kingdom, July 30, 1971, 35912/71

Int. Cl.² B29D *3/02*

U.S. Cl. 264—254 **6 Claims**

1. A process for the production of a metal reinforced polyester resin article which comprises locating a metal reinforcing member longitudinally within the mould cavity of a longitudinally extending pressure mould by means of at least one plastics support, said mould cavity having a channel in the bottom surface thereof, each plastics support having a base resting in the channel of the mould cavity of the mould, sides spaced from the longitudinal walls of the mould cavity, said sides providing a waisted profile, and an upper surface containing a recess into which part of the metal reinforcing member fits, whereby the metal reinforcing member is spaced from



said bottom surface, and curing a fibre-reinforced polyester resin composition containing mineral filler in said mould cavity around the metal reinforcing member to surround said metal reinforcing member with plastics material, whereby any path formed between the plastics support and the cured polyester resin composition is relatively long, thereby minimizing ingress of water to the reinforcing member along said path.

3,983,206

SEALANT SYSTEM FOR BURIAL VAULT AND METHOD OF APPLICATION

Bernard T. Juba, White Bear Lake, and James A. Collins, North Oaks, both of Minn., assignors to H. B. Fuller Company, St. Paul, Minn.

Filed Apr. 28, 1975, Ser. No. 572,113

Int. Cl.² B32B *13/12;* **E04H** *13/00*

U.S. Cl. 264—255 **12 Claims**

10. The method comprising the following steps:

I. Casting a concrete closure means for a burial vault and providing said closure means with a peripheral recess means around the underside thereof;

II. Inverting said closure means whereby said recess means faces upwardly;

III. Pouring into said recess means a first thermoplastic layer of essentially a first molten hot-melt composition consisting essentially of:

a. 55–65% by weight of substantially amorphous polypropylene with a molecular weight in the range of 2,000–5,000 and a ball and ring softening point in the range of about 90°–115°C.,

b. 15–25% by weight of a synthetic terpene resin which melts within the range of about 85°C. to about 105°C.; and

c. 15–25% by weight of a paraffinic oil; said first hot-melt composition having a glass transition temperature within the range of −5° to −15°C., being substantially solid and resistant to flow under the influence of gravity at temperatures below 65°C., being pourable and capable of seeking its own level with the temperature range of 90° to about 110°C., and upon solidification, having

a penetration value less than 300 mm. in 5 seconds at 25°C. in ASTM test D-217-T60, using a D-5 needle, and 200 grams of weight;

IV. Permitting said first thermoplastic layer to cool to a temperature below 60°C. and to solidify to form a solid, gel-like layer with a generally planar upper surface;

V. Pouring into said recess, on top of said generally planar surface, a second thermoplastic layer of essentially a second hot-melt composition consisting essentially of:

a. about 35–40% by weight of said substantially amorphous polypropylene,

b. 27–28% by weight of said synthetic terpene resin, and

c. 37–38% by weight of said paraffin oil; said second hot-melt composition having a glass transition temperature within the range of about −43°C. to about −40°C. and a penetration value greater than 400 mm. in 5 seconds at 25°C. in ASTM test D-217-T60, using a D-5 needle and 200 grams of weight; and

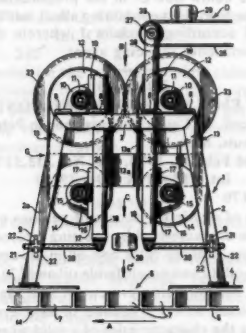
VI. Permitting said second thermoplastic layer to cool to room temperature, whereby said closure means is provided with a heterogeneous sealing element, formed in place within said recess, which sealing element is capable of providing a seal which can resist at least a 275 cm. hydrostatic head at 24°C.

3,983,207

METHOD FOR MANUFACTURING MOLDED PRODUCTS

Hendrik Sinnema, Bordine 74, Sneek, Netherlands

Division of Ser. No. 258,359, May 31, 1972, Pat. No. 3,834,851. This application July 9, 1974, Ser. No. 486,905
Claims priority, application Netherlands, June 1, 1971, 7107479
Int. Cl.² B28B *1/32*
U.S. Cl. 264—297 4 Claims



1. A method for the manufacture of molded bricks by depositing pre-formed distinct clods of kneadable material at a controlled velocity into molds, said method comprising transporting distinct pre-formed clods of materials one after another on a transport device to a molding station, advancing a succession of molds to the molding station at a location spaced below the transport device, releasing each clod in succession from the transport device for free deposit between two vertical lengths of adjacent endless belts disposed above the molds and traveling at a pre-determined velocity, transporting each clod in succession by said belts and guiding the clods for individual free discharge at said predetermined velocity of the belts at a predetermined height above a waiting mold where the clod is freely dropped and deposited into the mold without contacting the walls thereof whereafter the clod substantially fills the mold of its own accord, said lengths of the belts being positioned to receive each clod and transport the same vertically and discharge the clod at the speed of travel of the belts for free fall into the respective waiting mold.

3,983,208

RECOVERY OF VANADIUM AND COPPER CATALYST METALS USING KETONES

Jorge A. Blay, Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.

Filed Jan. 27, 1975, Ser. No. 544,158
Int. Cl.² C01G *3/00, 31/00;* C07C *55/14*
U.S. Cl. 423—27 7 Claims

1. A process for the separation of copper and vanadium catalyst metal values from an aqueous nitric acid solution containing said catalyst metal values as well as C_4 to C_6 alkyl dicarboxylic acids, said aqueous nitric acid solution being derived from the crystallization zone of a process wherein cyclohexanol and/or cyclohexanone are oxidized in the liquid phase by nitric acid oxidation in the presence of catalyst metals corresponding to said catalyst metal values to produce a reaction product comprising adipic acid, and the adipic acid product recovered by crystallization in said crystallization zone, comprising:

a. treating said aqueous nitric acid solution to remove substantially all of the nitric acid and water therefrom and obtain a substantially dry, molten-type residue comprising said dicarboxylic acids and said catalyst metal values;

b. intimately mixing said residue with an amount of a liquid dialkyl ketone solvent sufficient to dissolve the said dicarboxylic acids in said residue so as to form a liquid-solid suspension, each alkyl group of said dialkyl ketone being of from one to four carbon atoms, the liquid phase of said liquid-solid suspension comprising a solution of said dicarboxylic acids in the said ketone solvent and the solid phase of said liquid-solid suspension comprising said catalyst metal values;

c. adding to said liquid-solid suspension an amount of ammonia or ammonium hydroxide sufficient to neutralize from about 0.5 to 3% of the dicarboxylic acids contained therein; and

d. separating said solid phase comprising said catalyst metal values from said liquid-solid suspension.

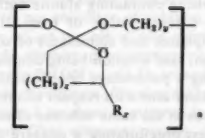
3,983,209

METHOD FOR TREATING BURNS

Edward Emil Schmitt, Palo Alto, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Filed Jan. 28, 1975, Ser. No. 544,807
Int. Cl.² A61K *31/74, 31/80*
U.S. Cl. 424—78 12 Claims

1. A method of treating burns in animals which comprises applying to the burned surface an agent selected from the group consisting of an antibacterial, antibiotic, antifungal and proteolytic enzyme and mixtures thereof in a hydrophobic, bioerodible polymer of the formula:



wherein R is a lower alkyl of 1 to 7 carbons, x is 0 or 1, y is 4 to 10, z is 1 to 3 and n is 10 to 1000, which polymer on bioerosion, releases an effective amount of the agent to the thermally produced wound for the treatment of said burn.

3,983,210

PROCESS FOR SEPARATION OF IRON FROM METAL SULPHATE SOLUTIONS IN HYDROMETALLURGIC PROCESSES

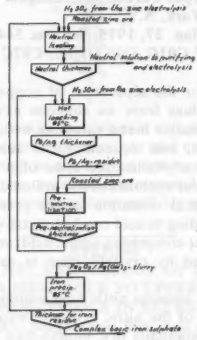
Georg Steintveit, Odda, Norway, assignor to Det Norske Zinkkompani A/S, Odda, Norway

Continuation-in-part of Ser. No. 181,821, Sept. 20, 1971, abandoned. This application Apr. 23, 1974, Ser. No. 463,265

Claims priority, application Norway, Sept. 30, 1970, 3703/70; Germany, Apr. 10, 1971, 2117584; Netherlands, Apr. 16, 1971, 7105172

Int. Cl.² C01G 9/06

U.S. Cl. 423—106 6 Claims



1. A process for the separation of iron from and the recovery of zinc from zinc sulphate solutions acidified with sulphuric acid and in which said solutions have a content of iron comprising the steps of adding a precipitating agent to such a solution and reacting it therewith at atmospheric pressure and at a temperature of from 85° to 95°C. thereby converting the iron content of the solution to a complex basic iron sulphate residue, said precipitating agent containing Fe_2O_3, $Fe(OH)_3$, or both, adjusting the acid strength of the solution during the reaction to a pH of from 1.4 to 1.7 by controlling the additions of precipitating agent added to the solution, and separating the resulting iron sulphate residue from the solution containing the zinc.

3,983,211

METHOD OF PRODUCING ALUMINA AND POTASSIUM SULPHATE FORM ALUNITE

Gakif Zakirovich Nasyrov, prospekt Nauki, 12, kv. 49; Nikolai Andreevich Kaluzhsky, Sredny prospekt, 6/13, kv. 123, both of Leningrad, and Vladimir Nikolaevich Kostin, Saviskaya naberezhnaya, 3, kv. 82, Moscow, all of U.S.S.R.

Continuation of Ser. No. 515,664, Oct. 17, 1974, abandoned, which is a continuation of Ser. No. 398,555, Sept. 18, 1973, abandoned. This application Aug. 25, 1975, Ser. No. 607,498

Claims priority, application U.S.S.R., Dec. 8, 1972, 1852006

Int. Cl.² C01F 7/06

U.S. Cl. 423—128 8 Claims

1. A method of producing alumina and potassium sulphate from alunite comprising contacting alunite with a solution of caustic alkalies at a temperature of from 70° to 90°C to thereby transfer sulphates and aluminates of sodium and potassium into solution, said solution being denoted the process solution; maintaining a percentage concentration in the process solution of sodium ions with respect to the sum of potassium and sodium ions in the same solution of not less than 70 per cent at all times; precipitating a mixture of sodium and potassium sulphates from the process solution; separating the precipitate from the remaining process solution; treating said precipitate with potassium hydroxide to obtain potassium sulphate; and recovering alumina from said remaining process solution.

3,983,212

ALUMINA PRODUCTION

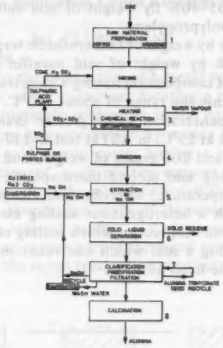
Hyman Moses Lowenstein, and Arthur Michael Lowenstein, both of 1 Hearn Drive, Northcliff, Johannesburg, Transvaal, South Africa

Filed Aug. 29, 1974, Ser. No. 501,788

Claims priority, application South Africa, Aug. 31, 1973, 73/5996

Int. Cl.² C01F 7/26

U.S. Cl. 423—137 6 Claims



1. A method of producing a product containing alkali soluble alumina consisting essentially of the steps of contacting an aluminum silicate material selected from the group consisting of clay minerals, coal ash and aluminum silicate ores with concentrated sulphuric acid containing 80 to 100 weight percent sulphuric acid, heating the aluminum silicate material and the acid to a temperature above 190°C and below the boiling point of the acid to produce a substantially anhydrous hard product containing aluminum sulfate and silica and decomposing the hard product by heat treatment at a decomposing temperature below 800°C. in the presence of a reducing agent to produce a product containing alkali soluble alumina.

6. A method according to claim 1 wherein the reducing agent is a carbonaceous reducing agent.

3,983,213

USE OF EMULSIONS IN CROWD CONTROL

Kenneth J. Lissant, St. Louis, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Feb. 26, 1973, Ser. No. 335,517

Int. Cl.² A01N 9/04, 17/10

U.S. Cl. 424—170 12 Claims

1. A process of restricting access of persons or animals to an area which is characterized by exerting a force on a thixotropic high internal phase ratio non-oil-in-oil emulsion comprising (1) non-oil, (2) an emulsifiable oil and (3) an emulsifying agent, said non-oil being present in said emulsion in an amount of at least 60% by volume of said emulsion, said emulsion having the characteristics of a solid when at rest and the characteristics of a liquid when a force is exerted on it, and propelling said emulsion at said area to which access is to be restricted.

3,983,214

FUNGICIDAL COMPOSITIONS AND METHOD FOR PROTECTING PLANTS BY THE USE THEREOF

Tomomasa Misato, Tokyo; Keng Tang Huang, Wako; Yasuo Homma, Kamifukuoka; Toshiro Shida, Kawasaki, and Hachiro Wakamatsu, Musashino, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Division of Ser. No. 419,067, Nov. 26, 1973, abandoned. This application Feb. 12, 1975, Ser. No. 549,493

Claims priority, application Japan, Dec. 8, 1972, 47-123654; Dec. 8, 1972, 47-123655; Feb. 28, 1973, 48-23251

Int. Cl.² A01N 9/00

U.S. Cl. 424—180 22 Claims

1. A fungicidal composition containing as an active ingredi-

ent, sucrose fatty acid ester whose ester group is derived from a fatty acid having 8 to 18 carbon atoms in an amount of about 0.1–90% by weight, based on the weight of the composition, and at least on adjuvant selected from the group consisting of solid carrier, liquid carrier, emulsifying agent, dispersing agent and surface active agent.

3,983,215

PROCESS FOR PREPARING NAOH.3.5 H_2O CRYSTALS

Chuji Hirata, Yokohama; Yasunori Yokogawa, and Tsutomu Tabira, both of Kawasaki, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed July 19, 1974, Ser. No. 489,927
Claims priority, application Japan, July 19, 1973, 48-81172
Int. Cl.² C01D 1/32
U.S. Cl. 423—198 9 Claims

5. A process for preparing NaOH.3.5 H_2O crystals, which comprises;

adding a member selected from the group consisting of NaOH, H_2O, aqueous NaOH and mixtures thereof to an NaOH solution containing NaOH.3.5 H_2O seed crystals at a temperature of from 10° to 0°C, so as to adjust the concentration of NaOH in the liquid phase of said NaOH solution to from 32 to 34% NaOH

$$\left(\frac{\text{NaOH}}{\text{NaOH}+H_2O} \times 100\right)$$

by weight;

precipitating NaOH.3.5 H_2O crystals from said 32 to 34% NaOH solution; and

separating said precipitated NaOH.3.5 H_2O crystals from said solution.

3,983,216

PROCESS FOR THE REMOVAL OF VINYL CHLORIDE FROM GAS STREAMS

Jerome R. Sudduth, Pasadena, and Donald A. Keyworth, Houston, both of Tex., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed June 3, 1975, Ser. No. 583,491
Int. Cl.² B01D 53/34
U.S. Cl. 423—240 7 Claims

1. The process for the removal of vinyl chloride from a gas stream that contains from 10 parts to 1000 parts by weight of vinyl chloride per million parts by weight of gas that comprises contacting the vinyl chloride in said gas with ozone in the presence of activated carbon.

3,983,217

METHOD FOR REMOVING SULFUR DIOXIDE FROM WASTE GASES

Ryoji Muraki; Masao Endo, both of Nishinomiya; Nobuaki Aoki, Hirakata; Kazuo Mizutani, Takatsuki, and Norio Fukui, Nishinomiya, all of Japan, assignors to Kurashiki Boseki Kabushiki Kaisha, Japan

Filed Sept. 16, 1974, Ser. No. 506,048
Claims priority, application Japan, Sept. 26, 1973, 48-108176
Int. Cl.² C01B 17/00
U.S. Cl. 423—242 9 Claims

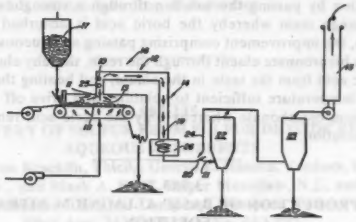
1. A method for removing sulfur dioxide from waste gases by a wet oxidation-absorption method, which comprises absorbing SO_2 contained in the waste gases with an absorbent consisting essentially of an aqueous solution of ammonium sulfate acidified with sulfuric acid to a pH of 3–4 in an adsorption tower, the concentration of said aqueous solution of ammonium sulfate being 0.1 to 3.0 moles/liter; oxidizing the absorbed SO_2 and dissociated HSO_3^- with air or oxygen in an oxidation tower at a temperature of 50° to 80°C to SO_4^{--} and HSO_4^-, the SO_2 absorbing capacity of the aqueous solution of ammonium sulfate thereby being restored; and circulating the recovered aqueous solution of ammonium sulfate to the absorption tower.

3,983,218

METHOD FOR DRY REMOVAL OF SULFUR DIOXIDE FROM FURNACE FLUE, COAL AND OTHER GASES

Sidney M. Heins, 6033 N. Sheridan Road, Chicago, Ill. 60660

Continuation-in-part of Ser. No. 90,618, Nov. 18, 1970, abandoned. This application Sept. 11, 1972, Ser. No. 287,781
Int. Cl.² B01J 8/00
U.S. Cl. 423—244 4 Claims



1. A method for the dry removal of sulfur dioxide from flue gas of a furnace having a chemical reaction chamber to which the flue gas at a temperature in the range of 800 to 1800°F. flows from a fuel combustion zone, using as a chemical reactant run-of-the-mill flue dust from open hearth and basic oxygen steel-making process, comprising the combination steps of:

a. injecting an amount of the dry flue dust into the flue gas in the chemical reaction chamber at least sufficient for the substantial absorption of the sulfur dioxide therein, and

b. cleaning the resulting chemical reaction products from the flue gas.

3,983,219

HIGH PURITY POLONIUM RECOVERY

Clyde H. H. Chong, Miamisburg; Calvin M. Love, Dayton; Martin D. Prisc, Bellbrook, all of Ohio, and Alexander J. Russo, Milpitas, Calif., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Oct. 1, 1973, Ser. No. 402,553
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976
Int. Cl.² C01F 13/00
U.S. Cl. 423—249 4 Claims

1. A method for providing a radioactive heat source element comprising contacting polonium containing polonium-210 with from about 4 to about 8 normal nitric acid to form a nitric acid solution containing from about 4 to about 7 curies of polonium-210 per milliliter of solution, adding a base to said solution to adjust the pH of said solution to from about 8 to about 9pH thereby precipitating polonium hydroxide having the formula $Po(OH)_4 \cdot xH_2O$, immediately cooling said solution and said precipitate, filtering said cooled precipitate within from about 2 to about 3 minutes in from about 10 to about 20 micron filter element, passing a heated inert gas through said filter element thereby drying said precipitate, heating said filter element to about 900°C in a vacuum of less than about 10^{-4} Torr to vaporize said polonium, and thereafter condensing said vaporized polonium in a heat source element.

3,983,220

RECOVERY OF BORIC ACID FROM ION EXCHANGERS

Charles W. Pollock, Richland, Wash., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Nov. 7, 1974, Ser. No. 521,984

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.² C01B *35/10*

U.S. Cl. 423—283 10 Claims

1. In the method for recovering boric acid from an aqueous solution by passing the solution through a strongbase anion exchange resin whereby the boric acid is adsorbed on the resin, the improvement comprising passing an aqueous ammonium bicarbonate eluent through the resin, thereby eluting the boric acid from the resin in the eluate, and heating the eluate to a temperature sufficient to volatilize and drive off the ammonium bicarbonate whereby only the boric acid remains in the solution.

3,983,221

PRODUCTION OF BASIC ALUMINIUM NITRATE SOLUTION

Jakob Rademachers; Peter Woditsch; Henning Erfurth; Bernd Holle, all of Krefeld, and Wilhelm Schnell, Mettmann, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 31, 1975, Ser. No. 563,761

Claims priority, application Germany, Apr. 23, 1974, 2419453

Int. Cl.² C01F *7/66*

U.S. Cl. 423—395 8 Claims

1. A process for the production of basic aluminum nitrate solutions by reacting metallic aluminum with nitric acid, comprising establishing a body of metallic aluminum, supplying additional aluminum to said body, supplying to said body countercurrent to the supply of the additional aluminum nitric acid of a concentration of about 5 to 30% by weight having basic aluminum nitrate dissolved therein and a pH of about 1 to 4, maintaining said body at a temperature of from about 30°C up to the boiling point of the nitric acid, whereby the aluminum reacts with the nitric acid, and removing solution containing reaction product adjacent the point of supply of the additional aluminum and remote from the point of supply of the nitric acid.

3,983,222

REMOVING NITRATES WITH AN ORGANIC AMINE SALT AND ION EXCHANGE

Timo Kalevi Lehto, Oulu, Finland, assignor to Kemira Oy, Finland

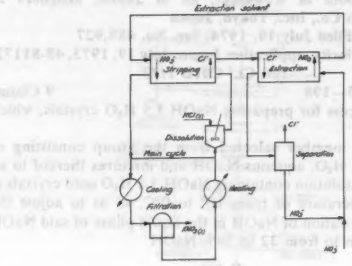
Filed Nov. 18, 1974, Ser. No. 524,926

Claims priority, application Finland, Nov. 22, 1973, 3604/73

Int. Cl.² C01B *21/48;* C01D *9/16*

U.S. Cl. 423—395 11 Claims

1. A continuous process for removing nitrates from nitrate containing aqueous solutions having a pH of about 0–7, which comprises: (1) extracting the nitrate containing aqueous solution with an organic amine salt dissolved in an organic solvent phase whereby the nitrate ion goes into the organic solvent, (2) separating the organic phase, (3) stripping the organic extraction solvent phase from the extraction with a stripping salt solution of pH at least 0.5, said salt being capable of ion exchange with the nitrate ion and containing the anion of the amine salt in step (1) to strip and convert the amine for the next extraction cycle into the same amine salt as used for the extraction; and the stripping solution contains the nitrate ion and the cation of the stripping solution; (4) maintaining the concentration of the salt formed by the cation of the stripping salt and the nitrate anion in the stripping solution so high that this salt is crystallized from the stripping solution substantially continuously, but still so low that the nitrate anion extracted into the organic extraction solvent phase passes during the stripping continuously into the stripping solution while the



anion of the stripping salt passes from the stripping solution into the organic extraction solvent phase; and recovering crystallized nitrate salt from the stripping solution.

3,983,223

PROCESS FOR THE PRODUCTION OF ALKALI PERCARBONATES

Karlheinz Janzon; Heinz Haschke, both of Hanau, and Rudolf Müller, Freigericht, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Filed Dec. 12, 1974, Ser. No. 532,295

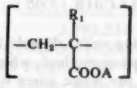
Claims priority, application Germany, Dec. 24, 1973, 2364634

Int. Cl.² C01B *15/10*

U.S. Cl. 423—415 P 15 Claims

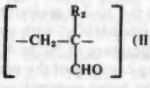
1. In the process of preparing an alkali metal percarbonate from aqueous alkali carbonate and hydrogen peroxide solution and crystalizing the percarbonate thus formed, the improvement comprising carrying out the reaction of the components in the presence of a polymeric carboxylate which is built of the following units:

Y + W/2 basic-mole percent units of the general formula:



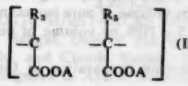
(I),

U-W basic-mole percent units of the general formula:



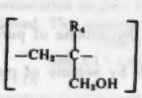
(II),

Z basic-mole percent units of the general formula:



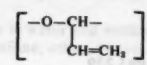
(III),

W/2 basic-mole percent units of the general formula:



(IV),

V basic-mole percent units of the general formula:



(V),

wherein:

U is 12 to 47,

V is 1 to 25,

W is 0.6U to U,

Y is 100 - (U + V + Z) and

Z is 0 to 20,

A is Mg/2, an alkali metal, hydrogen or ammonium ion,

R_1 is hydrogen, methyl, hydroxymethyl, ethyl, chlorine or bromine,

R_2 and R_4 are hydrogen or hydroxymethyl, and

R_3 and R_5 are hydrogen, methyl or ethyl.

3,983,224

ANHYDROUS MAGNESIUM CHLORIDE PROCESS

Ronald J. Allain, and David G. Braithwaite, both of Brookhaven, Miss., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Apr. 26, 1976, Ser. No. 680,403
Int. Cl.² C01F 5/34
U.S. Cl. 423—498 **7 Claims**

1. A method of preparing anhydrous magnesium chloride from magnesium chloride hydrates which comprises the steps of:

A. mixing together a magnesium chloride hydrate said hydrate containing minor amounts of water soluble sulfate and boron compounds as impurities with diethyl ether of tetraethylene glycol to prepare 0.1–6.0% by weight slurry of $MgCl_2$ in the diethyl ether of tetraethylene glycol and an azeotropic agent having a boiling point less than the diethyl ether of tetraethylene glycol in a quantity sufficient to remove water from said slurry;

B distilling water from said slurry wherein an anhydrous solution of $MgCl_2$ in diethyl ether of tetraethylene glycol containing the water soluble sulfate and boron compounds as insoluble impurities is formed;

C separating said $MgCl_2$ solution from the insoluble impurities;

D. adding to the $MgCl_2$ solution about 3.0 moles of ethylene glycol per mole of $MgCl_2$ present so as to prepare a $MgCl_2 \cdot 3$ moles ethylene glycol complex precipitate;

E. separating said precipitate from the diethyl ether of tetraethylene glycol and recovering the precipitate;

F. dissolving said precipitate in ethylene glycol to prepare a solution of the precipitate in ethylene glycol said ethylene glycol being used in a quantity so as to prepare an ethylene glycol solution containing from 1 to 20% by weight $MgCl_2$;

G. treating the ethylene glycol magnesium chloride solution with ammonia to form a magnesium chloride-ammonia complex which is insoluble in the ethylene glycol with the temperature of the ethylene glycol magnesium chloride solution being within the range of between −15° to 50°C;

H. separating the magnesium chloride-ammonia complex from the ethylene glycol;

I. washing the magnesium chloride-ammonia complex with a polar solvent having a lower boiling point than ethylene glycol to remove any ethylene glycol entrained in the magnesium chloride-ammonia complex;

J. heating the magnesium chloride-ammonia complex to a temperature sufficient to drive off the ammonia for a sufficient period of time to remove the ammonia, thereby forming anhydrous magnesium chloride; and then,

K. recovering anhydrous magnesium chloride which has a magnesium oxide content of less than 0.8% by weight and which is substantially free of impurities.

3,983,225

RECOVERY OF SULFUR FROM SULFUR DIOXIDE RICH AQUEOUS ABSORBENTS

Lester Van Brocklin, Thiells; George E. Hansen, Yonkers, both of N.Y., and Mark A. Kuck, Upper Montclair, N.J., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Apr. 24, 1974, Ser. No. 463,701
Int. Cl.² C01B 17/04
U.S. Cl. 423—574 R **4 Claims**

1. In a process for recovering sulfur in which sulfur dioxide containing gas is contacted with an aqueous absorbent to form an aqueous absorbent containing sulfur dioxide with a pH in the range of about 2.5 to about 5.0, and the aqueous absorbent containing sulfur dioxide is contacted with hydrogen sulfide to form sulfur and sulfur is separated from the aqueous absorbent, the improvement which comprises; providing a reaction-separation zone containing aqueous absorbent in the lower portion thereof and void space in the upper portion, forming a mixture of gas bubbles in the aqueous absorbent by passing a gaseous mixture containing hydrogen sulfide into a circulating zone of aqueous absorbent thereby forming a gas-liquid mixture, and passing the mixture through a zone of stationary apertures wherein the size of the gas bubbles in the mixture is reduced and whereby hydrogen sulfide in the gas is contacted with the aqueous absorbent containing sulfur dioxide to form sulfur, said gas mixture containing hydrogen sulfide is provided in an amount sufficient to react with the sulfur dioxide to form sulfur and to float the sulfur formed to the surface of the body of absorbent by the rising gas bubbles whereby the sulfur is separated from the aqueous absorbent.

3,983,226

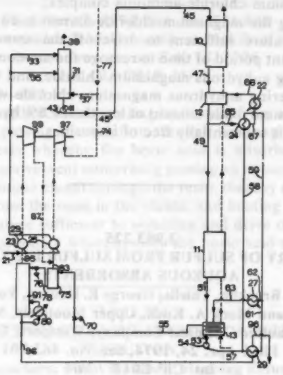
GAS STRIPPING AND RECIRCULATION PROCESS IN HEAVY WATER SEPARATION PLANT

Don Barkley Nazzer, Port Hawkesbury, Canada, and Victor R. Thayer, Newark, Del., assignors to Atomic Energy of Canada Limited, Ottawa, Canada

Continuation-in-part of Ser. No. 846,159, July 30, 1969, abandoned. This application Apr. 21, 1971, Ser. No. 135,874
Int. Cl.² B01D 19/00; C01B 5/02
U.S. Cl. 423—580 **6 Claims**

1. The method of gas recovery and recirculation in a gas/liquid counterflow process for isotopic separation in which hydrogen sulphide is at least partially soluble in the liquid, namely water, there being a pressurized hot isotope exchange zone and a pressurized cold isotope exchange zone for effecting isotope exchange between water and the gas at a predetermined process pressure, including the steps of: extracting at least a portion of liquid effluent having said gas in solution therein; producing a substantial drop in pressure in said liquid portion to strip hydrogen sulphide gas therefrom at a pressure substantially less than that of a said exchange zone; re-compressing said gas to a pressure less than that of said exchange

zone; absorbing the stripped gas into feed water entering the process as a source of deuterium, and pressurizing by pumping



the feed water with gas absorbed therein to a said isotope exchange zone to return said stripped gas to said zone.

3,983,227

DRY MIXTURE CONTAINING DIPHOSPHONATES AND A STANNOUS SALT USEFUL IN THE PREPARATION OF TC^{99m} CONTAINING BONE SCANNING AGENTS

Andrew John Tofe, and Marion David Francis, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 363,286, May 23, 1973, abandoned. This application Apr. 19, 1974, Ser. No. 462,477

Int. Cl.[2] A61K *43/00;* **G21H** *5/02;* **C07F** *9/32*

U.S. Cl. 424—1 **7 Claims**

1. A composition for the preparation of an improved bone scanning agent comprising a dry mixture of:

A. a phoshonate which is a member selected from the group consisting of (i) disodium-ethane-1-hydroxy-1,1-diphosphonate, (ii) a mixture of disodium- and trisodium-ethane-1-hydroxy-1,1-diphosphonate salts, the mole ratio of the disodium to trisodium salt being from about 4:1 to 1:1, (iii) dichloromethane diphosphonic acid, or the pharmaceutically acceptable salts thereof, and (iv) methane diphosphonic acid, or the pharmaceutically acceptable salts thereof;

B. an amount of an anhydrous reducing metal salt which is a member selected from the group consisting of stannous chloride and stannous sulfate sufficient to provide a molar ratio of stannous:phosphonate of from about 1:15 to 1:80.

3,983,228

WATER-IN-OIL ADJUVANT COMPOSITION

Allen F. Woodhour, Horsham, and Maurice R. Hilleman, Lafayette Hill, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 392,402, Aug. 28, 1973, abandoned, which is a continuation of Ser. No. 233,815, March 10, 1972, abandoned, which is a continuation-in-part of Ser. No. 141,401, May 7, 1971, abandoned. This application Nov. 19, 1974, Ser. No. 525,149

Int. Cl.[2] A61K *39/02, 39/12, 39/18, 47/00*

U.S. Cl. 424—89 **27 Claims**

1. An adjuvant composition comprising an oil and from about 0.5 – 10% by volume of pure isomannide monooleate.

16. An adjuvant composition comprising an oil, an antigen, from about 0.5 – 10% by volume of pure isomannide monooleate and from about 0.5 – 10% by volume of pure aluminum monostearate.

23. A parenteral vaccine preparation in the form of an emulsion comprising:

a. a disperse aqueous phase containing at least one antigenic substance;

b. a continuous oil phase;

c. from about 0.5 – 10% by volume of pure isomannide monooleate and

d. from about 0.5 – 10% by volume of pure aluminum monostearate.

3,983,229

VACCINES, THE PROCESS FOR PREPARING THE SAME AND THE APPLICATIONS THEREOF

Edgar Hans Relyveld, Paris, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Apr. 30, 1974, Ser. No. 465,712

Claims priority, application France, May 4, 1973, 73.16131

Int. Cl.[2] A61K *39/02, 39/12, 39/38, 39/40*

U.S. Cl. 424—92 **27 Claims**

1. A process for preparing a bacterial toxin comprising the steps of:

a. reacting a bacterial toxin with glutaraldehyde of a concentration ranging from about 0.00131 M to about 0.0526 M and for a duration just sufficient for almost complete detoxification within 1 hour with complete detoxification within 3 hours, said detoxification being equivalent to formaldehyde detoxification requiring a period of not less than 2 weeks, to detoxify and inactivate said toxin,

b. stopping the reaction as soon as said inactivation stage is reached, whereby an inactivated product is obtained which is usable as a bacterial toxin while remaining antigenic and retaining its immunizing power.

3,983,230

ANTIBIOTIC SIOMYCIN A DERIVATIVES AND PRODUCTION THEREOF

Kei Okabe, Yao; Mikao Mayama, Ikeda, and Shinzo Matsuura, Itami, all of Japan, assignors to Shionogi & Co., Ltd., Japan

Continuation-in-part of Ser. No. 461,432, April 15, 1974, abandoned. This application Mar. 7, 1975, Ser. No. 556,411

Claims priority, application Japan, Apr. 18, 1973, 48-43900

Int. Cl.[2] H61K *35/74*

U.S. Cl. 424—117 **10 Claims**

1. Half ester -I of siomycin A with butanedioic acid, yellowish powder, melting at 265° to 280°C with decomposition, containing the elements carbon, hydrogen, oxygen, nitrogen and sulfur in substantially the following proportions by weight: in the form of anhydrous compound; C, 50.42 %; H, 5.10 %; N, 14.57 %; S, 7.93 %, in the form of hydrate of the compound; C, 45.77 %; H, 5.45 %; N, 12.21 %; S, 7.62 %; H_2O, 10.68 %, having Rf of zero on thin-layer chromatography on silica gel GF (made by Merck company) [chloroform-methanol (8 : 2 by volume) solvent] having a specific rotation of $[\alpha]_D^{25}$ −63.2±2.0° (c = 0.525, in methanol), having a neutralization equivalent of 500, and showing an infrared absorption spectrum defined in FIG. 1 and an ultraviolet absorption spectrum defined in FIG. 2, and pharmaceutically acceptable salts thereof.

3,983,231

ANTIBIOTIC SUBSTANCES AND PREPARATION

Surendra N. Sehgal, Dollard des Ormeaux; Kartar Singh, Beaconsfield, and Claude Vezina, Deux-Montagnes, all of Canada, assignors to Ayerst McKenna and Harrison Ltd., Montreal, Canada

Division of Ser. No. 467,167, May 6, 1974, Pat. No. 3,911,112, which is a continuation-in-part of Ser. No. 377,985, June 10, 1973, abandoned. This application June 26, 1975, Ser. No. 590,542

Int. Cl.[2] A61K *35/74*

U.S. Cl. 424—118 4 Claims

1. A pharmaceutical composition for inhibiting the growth of pathogenic bacteria in a mammal which comprises a pharmaceutical carrier and an effective antibacterial amount of the antibiotic component 484A, which antibiotic component 484A

a. is soluble in water and methanol and substantially insoluble in acetone, ether, benzene, ethyl acetate and chloroform,

b. is convertible to acid addition salts,

c. gives one main zone of antimicrobial activity at 23 – 25 cm from origin on descending paper chromatography at 24°C for 48 hours on Whatman No. 1 paper using a solvent system consisting of n-propanol, pyridine, acetic acid and water (30:20:6:20) and two main spots 13 – 15 cm and 23 – 25 cm from origin in the same system as revealed by ninhydrin spray,

d. is convertible to a sulfate salt giving two main spots, Rf 0.15 – 0.16 and Rf 0.22 – 0.24 on ascending paper chromatography at 24°C for 16 hours on Whatman No. 1 paper using a solvent system consisting of n-propanol, pyridine, acetic acid and water (30:20:6:24) as detected by ninhydrin,

e. is convertible to a sulfate salt giving two zones, as detected by ninhydrin spray, Rf 0.30 – 0.32 and Rf 0.40 – 0.42 on circular paper chromatography using Whatman No. 1 paper and a solvent system consisting of n-propanol, pyridine, acetic acid and water (30:20:6:24) and in the same system gives one zone of antimicrobial activity at Rf 0.40 – 0.42,

f. has a representative infrared absorption spectrum in KBr pellet as shown in accompanying FIG. 2, showing bonds at 3300, 3080 (sh), 2940 (sh), 1710 (sh), 1660, 1550, 1390, 1310, 1105, 955, 920, and 850 cm^{-1},

g. inhibits growth of *Staphylococcus pyrogenes* (penicillin-sensitive), *Staphylococcus pyogenes* (penicillin-resistant), *Streptococcus faecalis*, *Escherichia coli*, *Aerobacter aerogenes*, *Salmonella pullorum*, *Pseudomonas aeruginosa*, *Proteus mirabilis*, *Proteus vulgaris*, *Klebsiella pneumoniae* and *Serratia marcescens*,

h. exhibits a LD_{50} (i.p., mice) mice) of 1.0 g/kg,

i. has about a 1 to 1 ratio of streptolidine and L-β-lysine moieties as indicated by amino acid analysis,

j. has a specific rotation, $[\alpha]_D^{25} = -25° \pm 3°$ (H_2O),

k. gives positive reaction with ninhydrin and silver nitrate and negative reactions with Elson-Morgan and Sakaguchi reagents, and

l. has an empirical formula $C_{18-19}H_{34-36}N_{7-9}O_{7-8} \times 1–3\ H_2O$.

2. A pharmaceutical composition for inhibiting the growth of pathogenic bacteria in a mammal which comprises a pharmaceutical carrier and an effective antibacterial amount of the antibiotic component 484B, which antibiotic component 484B

a. is soluble in water and methanol and substantially insoluble in acetone, ether, benzene, ethyl acetate and chloroform,

b. is convertible to acid addition salts,

c. gives a main area of antimicrobial activity at 17 cm and minor areas at 24 and 8 cm from the origin on descending paper chromatography at 24°C for 48 hours on Whatman No. 1 paper using a solvent system consisting of n-propanol, pyridine, acetic acid and water (6:4:1.5:4),

d. gives three zones, as detected by ninhydrin spray, Rf 0.16, 0.29 and 0.42, on circular paper chromatography using Whatman No. 1 paper and a solvent system consisting of n-propanol, pyridine, acetic acid and water (30:20:6:24),

e. has a representative infrared absorption spectrum in KBr pellet as shown in accompanying FIG. 3, showing bands at 3280, 3070, 2930, 1710, 1655, 1550, 1395, 1075 and 920 cm^{-1},

f. inhibits the growth of *Staphylococcus pyogenes* (penicillin-sensitive), *Staphylococcus pyogenes* (penicillin-resistant), *Streptococcus faecalis*, *Escherichia coli*, *Aerobacter aerogenes*, *Salmonella pullorum*, *Pseudomonas aeruginosa*, *Proteus mirabilis*, *Proteus vulgaris*, *Klebsiella pneumoniae* and *Serratia marcescens*,

g. exhibits a LD_{50} (i.p., mice) of about 100 mg/kg,

h. has about a 1 to 2 ratio of streptolidine and L-β-lysine moieties as indicated by amino acid analysis,

i. has a specific rotation, $[\alpha]_D^{24} = -12° \pm 2°$ (H_2O), and

j. has as an empirical formula $C_{23-25}H_{44-46}N_{9-10}O_{8-9} \times 1–5\ H_2O$.

3,983,232

NOVEL AGENT FOR TREATMENT OF DEHYDRATIONS IN VETERINARY MEDICINE, PROCESS FOR PREPARATION AND NEW USE THEREOF

Branislav Pekić; Vladislav Mladenović, and Dragan Cvetković, all of Leskovac, Yugoslavia, assignors to Zdravlje fabrika farmaceutskih i hemijskih proizvoda, Leskovac, Yugoslavia

Filed Feb. 18, 1975, Ser. No. 550,491

Claims priority, application Yugoslavia, Mar. 20, 1974, 761/74

Int. Cl.[2] A61K *31/70*

U.S. Cl. 424—180 21 Claims

1. Method for the treatment of dehydrations in an animal which comprises interperitoneally injecting affected animal with solutions of dextran or of hydroxyalkyl derivative of dextran.

3,983,233

COMPOSITIONS AND METHOD OF TREATING WITH STEREOISOMERIC MIXTURES OF 2-UNSYMMETRICAL 16,17-METHYLENEDIOXY STEROIDS

Ralph Lennart Brattsand, Lund; Bo Thuresson af Ekenstam, Moindal; Karl Goran Claeson, Saro, and Bror Arne Thalen, Lund, all of Sweden, assignors to AB Bofors, Bofors, Sweden

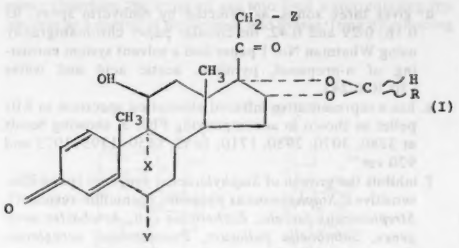
Continuation-in-part of Ser. No. 360,051, May 14, 1973, Pat. No. 3,929,768. This application Nov. 6, 1975, Ser. No. 629,389

Claims priority, application Sweden, May 19, 1972, 6644/72

Int. Cl.[2] C07J *17/00*

U.S. Cl. 424—241 48 Claims

1. A pharmaceutically-active composition, suitable for use in the treatment of inflammation, containing as active ingredient an effective antiinflammatory amount of a steroid compound, in combination with a pharmaceutically-acceptable carrier, said steroid compound being a stereoisomeric mixture of a 2'-unsymmetrical 16,17-methylenedioxy steroid having the general formula



(I)

wherein X and Y are independently selected from hydrogen and fluorine, X being selected from hydrogen and fluorine when Y is hydrogen and X being fluorine when Y is fluorine, Z is selected from hydroxyl and esterified hydroxyl wherein the hydroxyl group is esterified with a member of the group consisting of phosphoric and sulphuric acids, dicarboxylic acids having 2 to 12 carbon atoms, inclusive, pyridine-3-carboxylic acid, pyridine-4-carboxylic acid, benzofurane-2-carboxylic acid, and menthoxymethylcarboxylic acid, and lower-alkanoic acids having up to a maximum of 8 carbon atoms, and R is selected from straight and branched hydrocarbon chains having 2 to 10 carbon aoms, inclusive.

3,983,234

TREATMENT OF DYSKINESIAS

Anthony Campbell Sayers, Koniz, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed June 25, 1975, Ser. No. 590,146

Claims priority, application Switzerland, July 4, 1974, 9202/74

Int. Cl.[2] A61K *31/495, 31/495*

U.S. Cl. 424—250 5 Claims

5. A method according to claim 3, wherein clozapine is orally administered at a unit dose of 6 to 100 milligrams.

3,983,235

VETERINARY FEEDSTUFFS

Florin Seng, Cologne-Buchheim; Kurt Ley, Odenthal-Globusch, and Karl Georg Metzger, Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

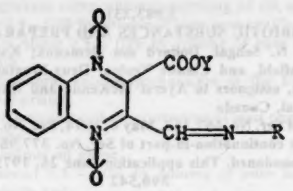
Division of Ser. No. 399,098, Sept. 20, 1973, which is a division of Ser. No. 323,953, Jan. 15, 1973, Pat. No. 3,856,957, which is a division of Ser. No. 130,007, March 31, 1971, Pat. No. 3,819,616. This application Mar. 27, 1975, Ser. No. 562,403

Claims priority, application Germany, July 21, 1971, 2015676

Int. Cl.[2] A61K *31/495*

U.S. Cl. 424—250 12 Claims

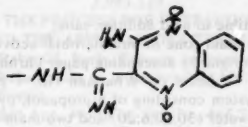
1. A veterinary feedstuff which comprises a growth promoting amount of a compound of the formula



or a pharmaceutically acceptable non-toxic salt thereof wherein

Y is hydrogen, an alkali metal cation or the cation $R^5—N^+H_3$; and

each of R and R^5 is



in combination with a nutritious material.

3,983,236

VETERINARY FEEDSTUFFS

Florin Seng, Cologne-Buchheim; Kurt Ley, Odenthal-Globusch, and Karl Georg Metzger, Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

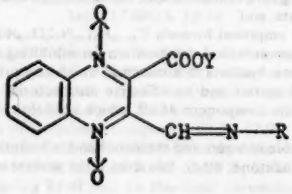
Division of Ser. No. 399,098, Sept. 20, 1974, which is a division of Ser. No. 323,953, Jan. 15, 1973, Pat. No. 3,856,957, which is a division of Ser. No. 130,007, March 31, 1971, Pat. No. 3,819,616. This application Mar. 28, 1975, Ser. No. 562,878

Claims priority, application Germany, July 21, 1971, 2015676

Int. Cl.[2] A61K *31/495*

U.S. Cl. 424—250 20 Claims

1. A veterinary feedstuff which comprises a growth promoting amount of a compound of the formula



or a pharmaceutically acceptable non-toxic salt thereof wherein

Y is hydrogen, an alkali metal cation or the cation $R^5—NH_3^+$; and

each of R and R^5 is identical to or different from the other and is

in which R^3 is alkyl of 1 to 4 carbon atoms or hydroxyalkyl of 1 to 4 carbon atoms in combination with a nutritious material.

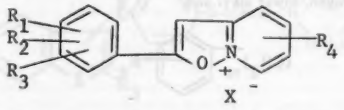
3,983,237

2-ARYL SUBSTITUTED ISOXAZOLO[2,3-a]PYRIDINYL HALIDES

David T. Connor, Parsippany; Patricia A. Young, Madison, and Maximilian von Strandtmann, Rockaway Township, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Sept. 8, 1975, Ser. No. 611,281
Int. Cl.² A61K *31/44*
U.S. Cl. 424—263 20 Claims

1. A compound of the formula I:



I

wherein R_1, R_2 and R_3 are each hydrogen, halogen, hydroxy, lower alkyl, lower alkoxy or lower alkanoyl; R_4 is hydrogen or lower alkyl; X is a bromide, chloride or iodide salt.

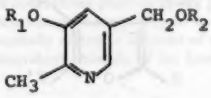
3,983,238

SUBSTITUTED PYRIDINOL-CONTAINING COMPOSITIONS AND METHODS FOR THE TREATMENT OF COCCIDIOSIS

Yasuhiro Morisawa; Mitsuru Kataoka; Taiichiro Watanabe; Noritoshi Kitano, and Toshiaki Matsuzawa, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 509,721, Sept. 26, 1974, abandoned, which is a division of Ser. No. 404,641, Oct. 9, 1973, Pat. No. 3,897,556. This application Mar. 12, 1975, Ser. No. 557,522
Claims priority, application Japan, Oct. 20, 1972, 47-105090; Apr. 11, 1973, 48-41111
Int. Cl.² A61K *31/44*
U.S. Cl. 424—266 66 Claims

1. An anticoccidial composition containing a minor amount, sufficient for the treatment of coccidiosis, which comprises a compound of the formula



intimately dispersed in an inert edible carrier, wherein R_1 and R_2 are each hydrogen, an aliphatic acyl group, an aromatic acyl group or a heterocyclic acyl group selected from the group consisting of a furoyl group, a thenoyl group, a nicotinoyl group and an isonicotinoyl group, and at least R_1 or R_2 is said heterocyclic acyl group; or a salt thereof.

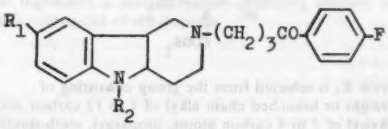
3,983,239

HEXAHYDRO-γ-CARBOLINE DERIVATIVES AND THEIR SALTS

Yasutaka Nagai, Mukou; Hitoshi Uno, Takatsuki; Masanao Shimizu, Kobe, and Tadahiko Karasawa, Toyonaka, all of Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan

Filed Mar. 12, 1975, Ser. No. 557,642
Claims priority, application Japan, Mar. 20, 1974, 49-31966
Int. Cl.² C07D *471/04*
U.S. Cl. 424—267 16 Claims

1. A hexahydro-γ-carboline derivative of the formula:



wherein R_1 is methyl or ethyl, and R_2 is hydrogen, methyl or ethyl, with proviso that when R_1 is ethyl, R_2 is hydrogen, and its phramaceutically acceptable acid addition salt.

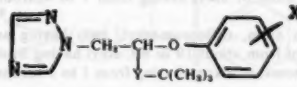
3,983,240

COMPOSITIONS AND METHOD FOR TREATING MYCOSES

Karl Heinz Buchel; Manfred Plempel, and Wolfgang Kramer, all of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Sept. 9, 1974, Ser. No. 504,429
Claims priority, application Germany, Sept. 19, 1973, 2347057
Int. Cl.² A61K *31/41*
U.S. Cl. 424—269 43 Claims

21. A method for treating mycotic infections in humans and animals which comprises administering to a human or animal in need thereof an antimycotically effective amount of an antimycotic composition comprising an antimycotically effective amount of a compound of the formula:



or a pharmaceutically acceptable non-toxic salt thereof wherein

X is halo;

n is 0 or an integer having a value of 1 to 5; and

Y is carbonyl or a ketal of the formula —$C(OR)_2$— wherein R is hydrogen or lower alkyl;

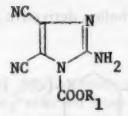
in combination with a pharmaceutically acceptable non-toxic inert diluent or carrier.

3,983,241
IMIDAZOLE DERIVATIVES

Sho Hashimoto, Odawara; Akira Nakada, Hiratsuka; Saburo Kano, and Susumu Takahashi, both of Odawara, all of Japan, assignors to Nippon Soda Company Limited, Tokyo, Japan

Filed July 28, 1975, Ser. No. 599,664
Claims priority, application Japan, Aug. 9, 1974, 49-90775
Int. Cl.² C07D 233/90
U.S. Cl. 424—273 15 Claims

1. A compound of the formula



wherein R_1 is selected from the group consisting of straight or branched chain alkyl of 1 to 12 carbon atoms, alkenyl of 3 to 4 carbon atoms, propargyl, methoxyethyl, alkyl of 2 to 4 carbon atoms substituted with one or two chlorine or bromine atoms and cyclohexyl.

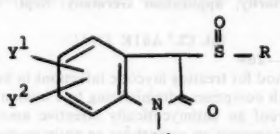
11. A method of preventing injury to plants due to fungi comprising applying to the locus to be protected an effective amount of the compound of claim 1.

3,983,242
3-ALKYLSULFINYL-2-INDOLINONES AND THEIR PHARMACEUTICAL COMPOSITIONS AND USE

Goetz E. Hardtmann, Morristown, and Thomas E. Jackson, Madison, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Filed Sept. 8, 1975, Ser. No. 611,174
Int. Cl.² A61K 31/40; C07D 209/34
U.S. Cl. 424—274 12 Claims

1. A compound which is an indolinone of the formula:



wherein

R is alkyl having from 1 to 4 carbon atoms,

R′ is a hydrogen atom or alkyl having from 1 to 4carbon atoms,

Y^1 is a hydrogen atom, trifluoromethyl, halo having an atomic weight of from about 19 to 80, alkyl having from 1 to 3 carbon atoms, or alkoxy having from 1 to 3 carbon atoms; and

Y^2 is a hydrogen atom, halo having an atomic weight of from about 19 to 80 or alkyl having from 1 to 3 carbon atoms; or a

non-toxic pharmaceutically acceptable salt thereof.

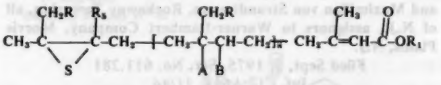
9. A pharmaceutical composition which is useful in sedating or relieving anxiety or muscular tension in a mammal comprising an effective amount of a compound of claim 1 and a pharmaceutically acceptable carrier.

3,983,243
EPITHIO COMPOUNDS

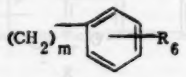
Albert Pfiffner, Pfaffhausen, and Ulrich Schwieter, Reinach, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 68,504, Aug. 31, 1970, Pat. No. 3,883,514, which is a continuation-in-part of Ser. No. 858,534, Sept. 16, 1969, Pat. No. 3,697,543. This application Dec. 11, 1974, Ser. No. 531,495
Claims priority, application Switzerland, Sept. 27, 1968, 14522/68; Aug. 29, 1969, 13141/69; Mar. 25, 1970, 4619/70
Int. Cl.² C07D 331/02
U.S. Cl. 424—275 6 Claims

1. A method for controlling insects comprising applying to materials to be protected a composition containing a compound of the formula



wherein A and B are hydrogen or taken together form a carbon to carbon bond or a sulfur bridge; R is hydrogen or lower alkyl; R_1 is selected form the group consisting of hydrogen, lower alkyl and



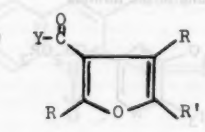
R_5 is methyl or hydrogen, R_6 is hydrogen, lower alkyl, hydroxy, lower alkoxy or halogen, *m* is an integer of from 0 to 1; and *n* is an integer from 0 to 1; and an inert carrier, said compound being present in said composition in an insecticidally effective amount sufficient to provide 0.01 percent to 1.0 percent of said compound on said material to be protected.

3,983,244
METHOD OF CONTROLLING PESTS USING CERTAIN KETONES OF FURAN

Zaven Stephen Ariyan, Woodbury; Robert Edward Grahame, Jr., Waterbury, and Winchester Loomis Hubbard, Woodbridge, all of Conn., assignors to Uniroyal Inc., New York, N.Y.

Division of Ser. No. 306,044, Nov. 13, 1972, Pat. No. 3,904,760. This application May 9, 1975, Ser. No. 575,910
Int. Cl.² A01N 9/00, 9/12
U.S. Cl. 424—275 14 Claims

1. A method of controlling acarids, insects or nematodes comprising applying to a locus, subject to attack by acarids, insects or nematodes, an acaricidally, insecticidally or nematocidally effective amount of a substituted furan having the formula



wherein:

Y is selected from the group consisting of alkenyl having from 2 to 8 carbon atoms, furyl, furyl substituted with chlorine, bromine or lower alkyl, thienyl, thienyl substituted with chlorine, bromine or lower alkyl, phenyl, and phenyl substituted with chlorine, bromine or lower alkyl;

R is selected from the group consisting of hydrogen, chlorine, bromine and C_1–C_8 alkyl;

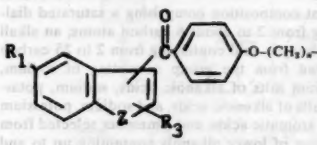
R′ and R″ are the same or different and are selected from the group consisting of chlorine, bromine and C_1–C_8 alkyl.

3,983,245
CERTAIN 4-(3-AZACYCLOALKOXY OR AZACYCLOALKYLMETHOXY)BENZOYLBENZOFURANS OR BENZOTHIOPHENES

David L. Ladd, Penllyn, and Stephen T. Ross, Berwyn, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Feb. 6, 1975, Ser. No. 547,528
Int. Cl.² A61K *31/34*; C07D *405/12*, *409/12*
U.S. Cl. 424—285 11 Claims

1. A compound of the formula:



or a pharmaceutically acceptable acid addition salt thereof, in which:

R_1 is hydrogen, chloro, bromo, trifluoromethyl or lower alkyl;

R_2 is straight or branched chain alkyl of from one to six carbon atoms;

R_3 is lower alkyl or phenyl$(CH_2)_p$ where p is 0 or 1 and the phenyl moiety is unsubstituted or substituted in the para-position with lower alkyl, lower alkoxy, halogen or trifluoromethyl;

m is 1 to 4;

n is 0 or 1; and

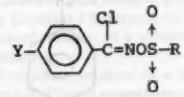
Z is oxygen or sulfur.

3,983,246
N-(SULFONYLOXY) BENZIMIDOYL HALIDES AS BACTERICIDAL OR FUNGICIDAL AGENTS

Loren Kenneth Gibbons; Clinton Joseph Peake, and Wayne Nelson Harnish, all of Medina, N.Y., assignors to FMC Corporation, Philadelphia, Pa.

Filed Apr. 4, 1974, Ser. No. 457,989
Int. Cl.² A01N *9/14*, *9/18*
U.S. Cl. 424—303 8 Claims

1. A method of combatting plant-infesting pathogenic fungi and bacteria which comprises applying to the plants a fungicidally or bactericidally effective amount of a substituted N-(sulfonyloxy)benzimidoyl chloride of the formula:



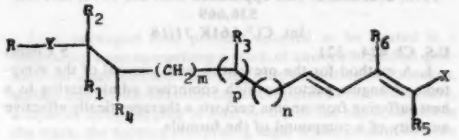
wherein Y is methoxy and R is methyl, ethyl, or propyl.

3,983,247
2,4-DODECADIENOIC ACID ESTERS AND USE FOR INSECTICIDES

Madhukar Subraya Chodnekar, Seltisberg; Ulrich Schwieter, Reinach; Peter Loeliger, Pfaffhausen; Albert Pfiffner, Bulach; Milos Suchy, and Rene Zurflüh, both of Pfaffhausen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Mar. 18, 1975, Ser. No. 559,619
Claims priority, application Switzerland, Mar. 22, 1974, 4037/74
Int. Cl.² C11C *3/02*; A01N *9/24*; A61K *31/23*
U.S. Cl. 424—312 16 Claims

9. An insecticidal composition containing as an essential active ingredient a metamorphosis inhibiting amount of a polyene compound of the formula:



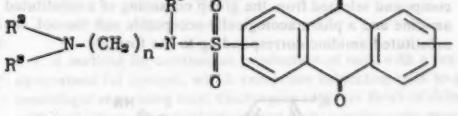
wherein R is lower alkenyl, lower alkynyl or a cyclopropylmethyl group, R_1, R_2, R_3 and R_6 are each hydrogen or a lower alkyl group, R_4 and R_5 are each hydrogen or methyl, Y is oxygen; X is —$COOR_7$, wherein R_7 is lower alkyl; n and p may be zero or 1 and m is an integer from zero to 2 inclusive; in association with a compatible carrier material.

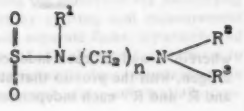
3,983,248
BIS(AMINOALKYLSULFAMOYL)ANTHRAQUINONE ANTIVIRAL AGENTS

Johann M. Grisar; Arthur D. Sill, and Robert W. Fleming, all of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Division of Ser. No. 777,885, Nov. 21, 1968, Pat. No. 3,627,791. This application Aug. 6, 1971, Ser. No. 169,861
Int. Cl.² H61K *31/18*
U.S. Cl. 424—321 10 Claims

1. A pharmaceutical composition, in unit dosage form, comprising from about 0.1 to 250 milligrams of a bis-(aminoalkylsulfamoyl)anthraquinone and a significant quantity of a pharmaceutical carrier, said anthraquinone selected from a base of the formula:





wherein each R^1 is hydrogen or methyl; each *n* is an integer of 2 to 4; each of R^2 and R^3 is alkyl of 3 to 5 carbon atoms or alkenyl of 3 to 5 carbon atoms; or a pharmaceutically acceptable acid addition salt of said base.

3,983,249

METHOD FOR TREATING ANGINA PECTORIS WITH CERTAIN N-ARYLSULFONYL-N'(AZA-3-BICYCLOALKYL) UREAS

Stewart J. Ehrreich, Suffern, N.Y., and Lester Zitowitz, West Orange, N.J., assignors to Science Union et Cie Societe Francaise de Recherche Medical, France

Continuation of Ser. No. 381,958, July 23, 1973, abandoned, which is a continuation-in-part of Ser. No. 347,245, March 30, 1973, abandoned. This application Dec. 26, 1974, Ser. No. 536,669

Int. Cl.² A61K *31/18*

U.S. Cl. 424—321 5 Claims

1. A method for the prevention and reversal of the symptoms of angina pectoris which comprises administering to a host suffering from angina pectoris a therapeutically effective quantity of a compound of the formula

or a pharmaceutically acceptable salt thereof, wherein X is hydrogen, chloro, bromo and methyl, R is methyl or hydrogen and *n* is an integer from 1 – 3.

3,983,250

HALOPHENYL ACETAMIDINES AS ANXIOLYTIC ANTIDEPRESSANTS

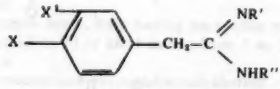
Abdulmuniem H. Abdallah, and Philip J. Shea, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 510,958, Oct. 2, 1974, Pat. No. 3,934,020. This application Oct. 9, 1975, Ser. No. 621,181

Int. Cl.² A61K *31/155*

U.S. Cl. 424—326 3 Claims

1. A composition useful for alleviating symptoms of central nervous system depression and anxiety in an animal comprising from about 0.001 to about 95 percent by weight of a compound selected from the group consisting of a substituted amidine and a pharmacologically-acceptable salt thereof, the substituted amidine corresponding to the formula:



wherein X and X' each independently represent halo or hydrogen, with the proviso that at least one of X and X' is halo and R' and R'' each independently represent loweralkyl.

3,983,251

SOLID ANTIFOAM CRYSTALS FOR DRY BEVERAGE MIXES

Gyanendra Singh, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 570,333, April 21, 1975, abandoned. This application Dec. 12, 1975, Ser. No. 640,295

Int. Cl.² A23L *2/40, 2/26*

U.S. Cl. 426—329 15 Claims

1. A rapidly dissolvable and substantially dry antifoam additive for dry beverage compositions comprising a uniform crystalline matrix of crystalline sugar, flavorant and silicone antifoam agent.

3,983,252

STABLE DIALDEHYDE-CONTAINING DISINFECTANT COMPOSITIONS AND METHODS

Gilbert Buchalter, 555 Mount Prospect Ave., Newark, N.J.

Continuation of Ser. No. 410,044, Oct. 26, 1973, abandoned, which is a continuation of Ser. No. 316,388, Dec. 18, 1972, abandoned. This application Mar. 18, 1975, Ser. No. 559,513

Int. Cl.² A61L *13/00*

U.S. Cl. 424—333 18 Claims

1. A disinfectant composition comprising a saturated dialdehyde containing from 2 to about 6 carbon atoms; an alkali metal salt of a carboxylic acid containing from 2 to 25 carbon atoms and selected from the group consisting of sodium, potassium or lithium salts of alkanoic acids, sodium, potassium, or lithium salts of alkenoic acids, and sodium, potassium or lithium salts of aromatic acids; and a member selected from the group consisting of lower alkanols containing up to and including 7 carbon atoms, alkanediols containing from 2 to 4 carbon atoms, glycerol and mixtures thereof, said alkali metal salt of a carboxylic acid being present in a weight ratio to said dialdehyde within the range of from about 0.05:1 to about 2:1, said lower alkanol, alkanediol or glycerol being present in a weight ratio to said alkali metal salt of a carboxylic acid within the range of from about 1:0.1 to about 1:3, said composition when dissolved in water providing a solution having a pH of within the range of from about 6 to about 7.4.

3,983,253

ETHYNYLINDENYL COMPOUNDS AND DERIVATIVES THEREOF USED IN THE TREATMENT OF PAIN, FEVER AND INFLAMMATION

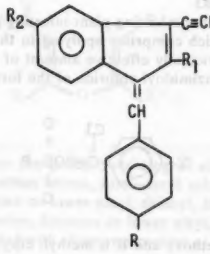
Julius Diamond, Lafayette Hill, and George H. Douglas, Paoli, both of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 306,702, Nov. 15, 1972, Pat. No. 3,810,944. This application Jan. 16, 1974, Ser. No. 433,677

Int. Cl.² A61K *31/085*

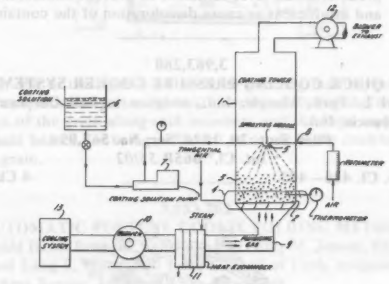
U.S. Cl. 424—340 21 Claims

1. A method for the relief of inflammation in a patient which comprises the administration thereto of a therapeutically effective amount between 0.5 to 100 milligrams per kilogram of body weight per day of a compound of the formula



where
R_1 is hydrogen or loweralkyl;
R is halo, nitro or halologweralkyl; and
R_2 is loweralkoxy.

3,983,254
ENCAPSULATION PARTICLES
David S. Alterman, Parsippany, and Kil Whan Chun, Ridgefield Park, both of N.J., assignors to Lever Brothers Company, New York, N.Y.
Division of Ser. No. 422,813, Dec. 7, 1973, Pat. No. 3,908,045. This application Apr. 14, 1975, Ser. No. 567,677
Int. Cl.² B32B 5/16; C11D 9/28
U.S. Cl. 428—403 3 Claims

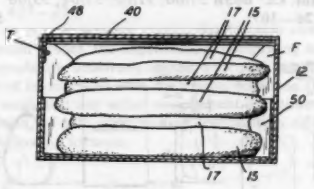


3. Encapsulated particles of an oxidizing material having at least one reactive chlorine atom in its molecular structure and being selected from the group consisting of potassium dichloroisocyanurate, sodium dichloroisocyanurate, pentaisocyanurate and trichlorocyanuric acid, said particles having thereon a complete and continuous inner and outer coating, the inner coating comprising a saturated fatty acid having from 12 to 20 carbon atoms or mixtures thereof, and the outer coating comprising a sodium salt of said acid or mixtures thereof; said inner coating being completely encapsulated by said sodium salt.

3,983,255
PREPARATION OF FERTILIZER AND ANIMAL FEED FROM MOLASSES FERMENTATION RESIDUE
Henry Herschel Bass, Potts Point, Australia, assignor to Unisearch Limited, Kensington, Australia
Filed Sept. 20, 1974, Ser. No. 507,703
Claims priority, application Australia, Oct. 2, 1973, 5063/73
Int. Cl.² C05F 11/00; A23K 1/02
U.S. Cl. 426—54 7 Claims

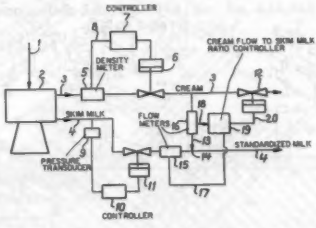
1. A process for converting a molasses fermentation residue into a coagulation product comprising:
a. concentrating said molasses fermentation residue to a solids level of from about 60 to about 80 weight percent thereof;
b. heating the concentrated residue to about its boiling point to induce thickening thereof;
c. cooling the concentrated residue to about 80°C.;
d. admixing up to about 15 percent by weight, based upon the concentrated residue, of a soluble phosphate to form a resultant mixture;
e. heating said resultant mixture to a temperature of from about 105° to 120°C until coagulation thereof is obtained; and,
f. recovering the coagulation product.

3,983,256
PRECOOKED FARINACEOUS FOODS ADAPTED FOR MICROWAVE HEATING AND A SYRUP TOPPING THEREFOR
Helen R. Norris; Carolyn M. Niemand, and David W. Andreas, all of Minneapolis, Minn., assignors to The Pillsbury Company, Minneapolis, Minn.
Filed Feb. 10, 1975, Ser. No. 548,320
Int. Cl.² A21D 13/00
U.S. Cl. 426—94 16 Claims



1. A packaged food product adapted to be heated in a microwave oven comprising a stack of cooked breakfast griddle food units selected from the group consisting of pancakes, waffles and french toast having a soft porous crumb structure, a layer of syrup topping at least on top of the top food unit in the stack, the topping comprising sugar in the amount of from 35 to 65 percent by weight from about 8 to 45 percent by weight of water, and 10 to 40 percent fat by weight, said topping being in a nonfluid condition and being meltable to the fluid condition by the application of the heat from a microwave oven and a semi-rigid combination shipping and heating container enclosing the stack.

3,983,257
PRODUCTION OF MILK WITH PREDETERMINED FAT CONTENT
Rolf Malmberg, Lund, and Lars Gustav Olenfalk, Jarfalla, both of Sweden, assignors to Alfa-Laval AB, Tumba, Sweden
Filed May 17, 1974, Ser. No. 470,864
Claims priority, application Sweden, May 29, 1973, 7307559
Int. Cl.² A01K 43/00
U.S. Cl. 426—231 2 Claims



1. A method for continuous production of milk with a predetermined fat content, which comprises subjecting milk to a centrifugal separating step, discharging separate flows of skim milk and cream from said separating step, continuously measuring the density of said discharging cream to provide measurement impulses, maintaining the density of the discharging cream substantially constant by causing said measurement impulses to control one of said separate flows, separately and continuously measuring flows of said skim milk and cream to provide respective flow measurement values, maintaining the quotient of said flow measurement values substantially con-

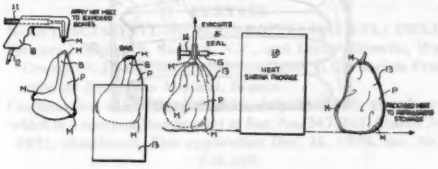
stant whereby changes in one of said flows are caused to change the other flow in a corresponding manner, and re-mixing said measured flows of skim milk and cream.

3,983,258

PROCESS OF PACKAGING EDIBLE PRODUCTS CONTAINING EXPOSED BONES

Norman D. Weaver, Bartlett, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Feb. 7, 1975, Ser. No. 548,030
Int. Cl.² B65B *25/00, 31/02, 53/04, 53/06*
U.S. Cl. 426—307 **5 Claims**



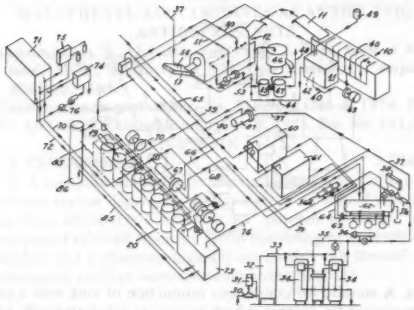
1. A process of packaging an edible product having an exposed bone comprising the steps of applying liquid hot melt material to coat substantially only the exposed bone, encasing the thus coated product in a flexible package, said liquid hot melt material having a penetration value and being applied in an amount and to a location on the bone sufficient to provide cushioning protection for the flexible package from the bone, thereby preventing rupture of the flexible package, and thereafter adhering the hot melt material to the flexible package with a bond strength greater than that between the hot melt material and the bone whereby upon the removal of the edible product from the flexible package the hot melt material peels from the bone and remains adhered to the flexible package.

3,983,259

FOOD PROCESSING SYSTEM

David G. Maior, Detroit, Mich., assignor to Campbell Research Corporation, Detroit, Mich.

Filed June 17, 1974, Ser. No. 479,758
Int. Cl.² A23B *7/06*
U.S. Cl. 426—401 **10 Claims**



1. In the method of processing food products and the like utilizing water and steam wherein the product is first washed, then blanched with steam in a blancher, sprayed after removal from the blancher in a washer, canned in containers in a can filling area, the cans are then retorted under steam pressure in a retort area, and finally the cans are cooled with water in the retort area, the steps comprising

drawing water from a source,

passing the water thereafter through a water softener,

thereafter passing the water through an electrostatic device to inactivate components such as calcium, magnesium, salts and carbonates and prevent them from precipitating,

and thereafter utilizing a portion of said water from said electrostatic device for the retort area, the can filling area, and the spraying of the product after removal from blanching,

heating said water and passing to said can filling area by heat exchange relation with steam,

treating another portion of the water from the electrostatic device with chlorine sufficient to substantially reduce the undesirable bacteria to a predetermined level and passing said chlorinated portion to the blancher and the washer,

continuously circulating said water in said retort area through a cooling tower spaced from said retort area,

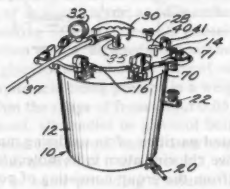
and maintaining the ph of said water in the retort area at a predetermined level sufficient to prevent contamination and insufficient to cause discoloration of the containers.

3,983,260

QUICK COOLING PRESSURE COOKER SYSTEM

Karl L. Ford, Muncie, Ind., assignor to Ball Corporation, Muncie, Ind.

Filed Sept. 20, 1974, Ser. No. 567,994
Int. Cl.² B65B *55/02*
U.S. Cl. 426—403 **4 Claims**



1. A method of processing food comprising the steps of sequentially

a. subjecting food packed into separate relatively loosely sealed glass containers and in a confined volume to steam under pressure for a predetermined period of time, each of said containers being relatively loosely sealed with a lid of metal,

b. terminating application of steam under pressure to said containers in said confined volume after said predetermined period of time, and

c. directing a stream of cooling water directly on at least selected ones of said metal lids of containers within said confined volume, while preventing said stream of water from being directed squarely on said glass containers, to facilitate quick, safe removal of said containers from said confined volume.

3,983,261

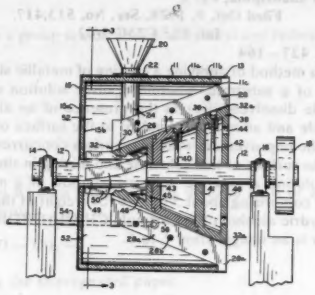
METHOD FOR MILLING GRAIN WHILE SIMULTANEOUSLY COOKING THE GRAIN

Fausto Celorio Mendoza, Lomas de Chapultepec, Mexico 10, D.F., Mexico

Division of Ser. No. 503,488, Sept. 5, 1974, Pat. No. 3,935,808. This application June 25, 1975, Ser. No. 590,329
Int. Cl.² B02B *17/00;* **A23P** *1/00*
U.S. Cl. 426—473 **3 Claims**

1. The method of milling grains while simultaneously cooking the grain which comprises; introducing the grain in unground form between a pair of concentric conical grinding members near the smaller end thereof, relatively rotating said grinding members while advancing the grain toward the larger

end of the members, reducing the size of the grain with the simultaneous development of heat during the movement of the grain along said members, and supplying heated gas to the surface of the outer grinding member not in contact with the



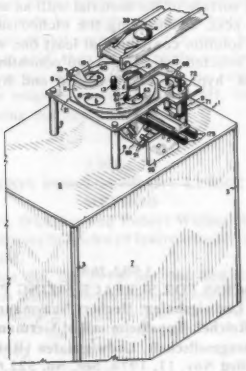
grain and to the surface of the inner grinding member not in contact with the grain, the heat developed during the movement of the grain along said members and the heat supplied by said heated gas being sufficient to result in the cooking of the grain.

3,983,262

AUTOMATIC FORTUNE COOKIE FOLDING METHOD

Ronald H. M. Brunner, Salt Lake City; Billy M. Jensen, Sandy, and Lang S. Wong, Salt Lake City, all of Utah, assignors to China Bazaar, Inc., Salt Lake City, Utah

Division of Ser. No. 469,617, May 13, 1974, Pat. No. 3,894,829. This application July 14, 1975, Ser. No. 595,873
Int. Cl.² A21D *6/00*
U.S. Cl. 426—502 **5 Claims**



1. A method for folding flat circular wafers into the shape characteristic of fortune cookies comprising the steps of:

a. folding a wafer once along a diameter by urging the wafer through a slot-like opening by means of a reciprocating plunger so that a semicircularly-shaped article is formed;

b. then grasping the once-folded wafer at opposite ends of the first fold line with the jaws of two pairs of pincers; and

c. then moving said pincers towards one another and towards and edge that is arranged to extend perpendicular to the plane of the once-folded wafer so that the midpoint of the first fold line is forced against said edge and, followingly, a second fold is made about said edge so that the twice-folded wafer has the shape characteristic of a fortune cookie.

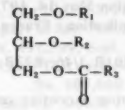
3,983,263

POWDERED ACRYLIC PAINT COMPOSITION AND METHOD

Philip Weiss, Birmingham, and Gordon D. Cheever, Rochester, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed June 27, 1974, Ser. No. 483,689
Int. Cl.² B05D *7/00*
U.S. Cl. 427—27 **7 Claims**

1. In an acrylic powder coating formulation containing an acrylic resin binder, the improvement comprising including in said formulation uniformly mixed with said acrylic resin an amount of from 5% to 30% by weight, based on the amount of said resin and any other nonpigment constituents in said formulation, of a flow promoting composition characterized by the following formula:



where R_1 may be -H or

R_2 may be -H or

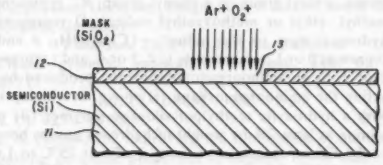
and R_3 is a hydrocarbon chain from 12 to 20 carbon atoms.

3,983,264

METAL-SEMICONDUCTOR OHMIC CONTACTS AND METHODS OF FABRICATION

Walter H. Schroen; Francois A. Padovani, both of Dallas, Tex., and Hanspeter P. K. Hentzschel, Reutlingen, Germany, assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 273,553, July 20, 1972, abandoned. This application Jan. 18, 1974, Ser. No. 434,464
Int. Cl.² B01D *3/06*
U.S. Cl. 427—39 **15 Claims**



1. A process for the fabrication of a semiconductor ohmic contact structure comprising the steps of:

a. exposing a selected portion of a semiconductor body to a glow discharge in the presence of an inert gas;

b. then exposing said selected portion to a glow discharge in oxygen or nitrogen, at conditions selected to form an adherent uniform film of nonconductor 10–100 Angstroms thick on said selected portion of the semiconductor body; and then

c. forming an adherent film of conductor on said nonconductor film, to complete a contact structure having linear I–V characteristics.

9. A process as defined by claim 1 wherein said semiconductor body is first subjected to a chemical cleaning treatment, and wherein the nonconducting film is formed by ambient oxidation.

3,983,265

METHOD OF COATING A SUBSTRATE WITH CURABLE ORGANOPOLYSILOXANE COMPOSITIONS

Michel Letoffe, Ste-Foy-les-Lyon, France, assignor to Rhone-Poulenc S.A., Paris, France

Division of Ser. No. 468,871, May 10, 1974, Pat. No. 3,933,729. This application May 14, 1975, Ser. No. 577,152
Claims priority, application France, May 11, 1973, 73.17157
Int. Cl.² H01B *3/46*; B32B *27/28*
U.S. Cl. 427—58 **5 Claims**

1. A method of forming a coating on a substrate which comprises coating a substrate with an organopolysiloxane composition vulcanisable at ambient temperature and above, comprising in parts by weight:

A. 100 parts of an α,ω-dihydroxydiorganopolysiloxane polymer, of viscosity 500 cPo at 25°C to 1 million cPo at 25°C, in which each organic radical bonded to each silicon atom, independently is an alkyl radical with 1 to 3 carbon atoms, a halogenoalkyl radical with 3 or 4 carbon atoms, a vinyl radical, an aryl radical with 6 to 8 carbon atoms, a halogenoaryl radical with 6 or 7 carbon atoms or a cyanoalkyl radical with 3 or 4 carbon atoms; at least 60% of these organic radicals being methyl radicals;

B. 10 to 50 parts of a methylpolysiloxane resin consisting of units of the formula $R(CH_3)_2SiO_{0.5}$ and units of formula SiO_2, wherein R represents an alkyl radical with 1 to 3 carbon atoms or a vinyl radical, and the value of the ratio of the number of $R(CH_3)_2SiO_{0.5}$ units to the number of SiO_2 units is 0.4:1 to 1.2:1, these polymers containing at least 0.5% but not more than 3.5% by weight of hydroxyl groups bonded to the silicon atoms;

C. 10 to 70 parts of a filler;

D. 0.5 to 15 parts of an aminoorganosilicon compound which is an aminoorganosilane of the general formula (i)

$$(R''O)_{3-p}R'_pSi[(CH_2)_nO]_m(CH_2)_tNHQ$$

in which R′ represents an alkyl group with 1 to 4 carbon atoms, a vinyl group or a phenyl group, R″ represents a methyl, ethyl or methoxyethyl radical, Q represents a hydrogen atom or the radical $-(CH_2)_2NH_2$, *p* and *m* represent 0 or 1, *n* represents 1, 2, 3 or 4, and t represents 2 or 3; or an aminoorganopolysiloxane produced by reacting the aminoorganosilane (i) above, in which *p* is 0, with a hydroxylic methylpolysiloxane polymer (ii) containing at least 2% by weight of hydroxyl groups bonded to the silicon atoms, of viscosity 1 cPo at 25°C to 1,000 cPo at 25°C, of the average general formula $(CH_3)_a(HO)_b—SiO_{(4-a-b/2)}$ in which *a* represents any number from 1.6 to 2.3 and *b* represents any number ranging from 0.1 to 1; the amounts of aminoorganosilane (i) and hydroxylic methylpolysiloxane polymer (ii) being such that there are 0.4 to 1.2 mols of (i) per gram(hydroxyl group) of (ii); and

E. 0 to 10 parts of at least one compound selected from the group consisting of alkyl silicates and alkyl polysilicates in which the alkyl radical has 1–3 carbon atoms;

and then curing the coating of the composition on the substrate at ambient temperature or above.

3,983,266

METHOD FOR APPLYING METALLIC SILVER TO A SUBSTRATE

Harry Bahls, Wayne, Pa., assignor to Peacock Laboratories, Inc., Philadelphia, Pa.

Filed Oct. 9, 1974, Ser. No. 513,417
Int. Cl.² C23C *3/02*
U.S. Cl. 427—164 **15 Claims**

1. In a method of applying a coating of metallic silver to the surface of a substrate, wherein a silver solution containing reducible dissolved silver in the presence of an alkali metal hydroxide and ammonia is applied to the surface of said substrate, the improvement which comprises concurrently applying to the surface of said substrate and mixing in situ with said silver solution a separate aqueous solution of a moderating reducer comprising about 5 to 35%, by weight of the water, of a polyhydric alcohol of the formula $CH_2OH(CHOH)_nCH_2OH$ where *n* is an integer from 1 to 6.

3,983,267

TREATMENT OF THE SURFACES OF POLYPHENYLENE OXIDE MATERIALS

Philip John Norris, Burton-on-Trent, England, assignor to W. Canning & Company Limited, Birmingham, England

Filed Sept. 23, 1974, Ser. No. 508,356
Claims priority, application United Kingdom, Sept. 25, 1973, 44863/73
Int. Cl.² B05D *3/10*; C25D *5/56*
U.S. Cl. 427—307 **6 Claims**

1. A process for preparing the surface of a polyphenylene oxide material for electroless deposit of metal prior to activation of the surface thereof, comprising:

etching the surface of the material with an etch containing chromic acid, and treating the etched surface with an aqueous solution containing at least one strongly reducing acid selected from the group consisting of phosphorous acid, hypophosphorous acid and hypophosphoric aicd.

3,983,268

PROCESS FOR SURFACE SIZING PAPER

Emil Scharf, Ludwigshafen; Herbert Naarmann, Wattenheim, and Fritz Reichel, Eppelheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

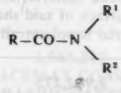
Filed Nov. 11, 1974, Ser. No. 522,631
Claims priority, application Germany, Nov. 1973, 2357064
Int. Cl.² B05D *3/02*
U.S. Cl. 427—341 **7 Claims**

1. A process for the manufacture of surface-sized paper by impregnating paper with an aqueous solution containing 0.1 to 5% by weight of salts of random copolymers obtained by copolymerization of

a. from 50 to 90% by weight of α-olefins of from 2 to 12 carbon atoms and

b. from 50 to 10% by weight of acrylic acid, methacrylic acid or mixtures thereof

and neutralization thereof to give copolymers having K values of from 20 to 40, and from 0.1 to 20% by weight of a compound of the formula:



where R is a group selected from alkyl, aryl and radicals of the formula:

and R^1 and R^2 each independently denotes H, R or a radical of the formula:

$$R - O - CH_2 -$$

and drving the impregnated paper.

3,983,269

DURABLE PRESS COMPOSITION AND PROCESS

Glenn A. Pearson, 1311 Delaware Ave., S.W., Washington, D.C. 20024

Continuation-in-part of Ser. Nos. 324,156, Jan. 16, 1973, Pat. No. 3,883,462, Ser. No. 324,157, Jan. 16, 1973, abandoned, Ser. No. 324,158, Jan. 16, 1973, abandoned, and Ser. No. 224,250, Feb. 7, 1972, abandoned, which is a continuation of Ser. No. 109,035, Jan. 22, 1971, abandoned, which is a continuation of Ser. No. 763,981, Sept. 30, 1968, abandoned. This application Sept. 30, 1974, Ser. No. 510,758

The portion of the term of this patent subsequent to May 13, 1992, has been disclaimed.

Int. Cl.² B05D *3/12*; C08L *61/20*; D06M *15/12*

U.S. Cl. 427—370 9 Claims

1. A method for treating textiles to impart permanent press characteristics thereto which comprises treating the textile with an acidic resinous solution prepared by forming the reaction product of (a) a condensation product prepared by reacting 40–60 parts by weight of an aldehyde, 2–8 parts by weight of a polyalkylol amine and 3–7 parts by weight of a strong inorganic acid, then adding to the condensation product 15–35 parts by weight of a urea, the resinous solution being a stable solution having an acid pH, and thereafter, drying and curing the treated textile.

3,983,270

COMPOSITION FOR BOUNDARY LUBRICANT AND METHOD

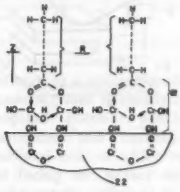
James J. Licari, Whittier, and Robert Willing, Anaheim, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 26, 1973, Ser. No. 409,848

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² C23C *1/10*

U.S. Cl. 427—372 9 Claims



1. A method of boundary lubricating a wear surface, said method compirising:

forming a chlorine-free metallic coordination complex of a long chain fatty acid, wherein said fatty acid is selected from an homologous carboxylic series and wherein the metallic constituent is a transition metal capable of forming coordination complexes selected from Cr, Mn, Fe, Co, Ni, and Al, by;

reducing an oxide of said transition metal to an acetate of said transition metal,

hydrating said acetate of said transition metal, olating the product of said hydrating step,

forming a coating of said chlorine-free metallic coordination complex on said wear surface; and

heating the coated wear surface to polymerize said metallic coordination complex and to anchor said complex to said wear surface.

3,983,271

YARN SIZES, SIZING TREATMENTS AND RESULTING SIZED YARNS

James C. Pangle, Jr., Danville, Va., and Alton D. Hicks, Mauldin, S.C., assignors to Dan River Inc., Danville, Va.

Division of Ser. No. 177,827, Sept. 3, 1971, which is a division of Ser. No. 744,292, July 12, 1968, Pat. No. 3,630,983, which is a continuation-in-part of Ser. Nos. 407,551, Oct. 29, 1964, abandoned, Ser. No. 491,399, Sept. 29, 1965, and Ser. No. 670,787, Sept. 26, 1967. This application Aug. 29, 1975, Ser. No. 609,800

Int. Cl.² D06M *13/20*

U.S. Cl. 427—390 10 Claims

1. A method for preparing and finishing textile materials which comprises:

A. treating a textile material with an aqueous solution of a mixed salt of a copolymer, said copolymer comprising 0.67 to 1.0 molar proportion of maleic anhydride, and one molar proportion of at least one monovinyl aromatic monomer containing 8 to 12 carbon atoms, and wherein

a. from 20 to 80% of the free carboxyl groups of said interpolymer are combined with at least one fixed base selected from the group consisting of alkali metal bases, and

b. from 20 to 80% of the free carboxyl groups of said interpolymer are combined with at least one fugitive base selected from the group consisting of ammonia, ammonium hydroxide and volatile amines,

such that a total of from 40 to 100% of said free carboxyl groups are so combined, and

B. heating the treated textile material at a temperature high enough to volatilize the fugitive base.

3,983,272

METHOD FOR IMPROVING THE LUBRICATING PROPERTIES AND IMPARTING ANTISTATIC PROPERTIES TO ORGANIC FIBERS

Peter Huber; Ewald Pirson, and Helga Lampelzammer, all of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Jan. 24, 1975, Ser. No. 543,850

Claims priority, application Germany, Feb. 6, 1974, 2405717

Int. Cl.² D06M *13/28*, *15/66*

U.S. Cl. 427—407 R 8 Claims

1. A method for improving the lubricating properties and imparting antistatic properties to organic fibers which comprises coating twisted organic fibers with a composition consisting essentially of a diorganopolysiloxane having a viscosity of from 500 to 10,000 cSt at 25°C. in which the organo groups contain from 1 to 5 carbon atoms, from 0.1 to 30 parts by weight for each 50 to 100 parts by weight of the diorganopolysiloxane, of a phosphorous compound having the general formula

$$(O)P(OH)_xY_{3-x}$$

in which Y represents a group selected from the class consisting of hydrocarbon and hydrocarbonoxy radicals, and when Y

is a hydrocarbon radical x is 0 and when Y is a hydrocarbonoxy radical x is a number of from 0 to 2, and up to 50 parts by weight of a paraffin wax for each 50 to 100 parts by weight of the diorganopolysiloxane, said phosphorous compound being soluble in the diorganopolysiloxane and paraffin wax.

3,983,273

CARDING MACHINES

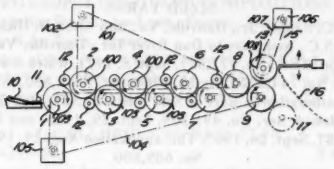
Gordon Henry Elliott, Bridgwater, England, assignor to Bonded Fibre Fabric Limited, Bridgewater, England

Filed May 2, 1974, Ser. No. 466,453

Claims priority, application United Kingdom, May 9, 1973, 22241/73; Oct. 4, 1973, 46445/73; Dec. 17, 1973, 58421/73

Int. Cl.[2] B05D *3/00*

U.S. Cl. 427—430 8 Claims



1. A carding machine for forming a fibrous web from textile fibres comprising at least three carding cylinders arranged in succession, worker means associated with the carding cylinders for working fibres progressively from cylinder to cylinder, means for rotating the cylinders at successively increasing peripheral speeds in the direction of travel of the fibres and for rotating each successive cylinder in an opposite direction to the preceding cylinder, a doffer in working relationship with the last cylinder for receiving the fibres, means for rotating the doffer at a peripheral speed less than the peripheral speed of the last carding cylinder, and means for removing the fibres from the doffer in the form of a fibrous web, the doffer being mounted with its peripheral surface spaced from the peripheral surface of the penultimate carding cylinder by a distance between 0.017 and 0.50 inches to receive fibres projected from the last carding cylinder to the doffer through a confined space defined between the doffer, the pneultimate carding cylinder and the last carding cylinder.

3,983,274

ALUMINUM-COPPER-NICKEL ALLOY FOR THE PRODUCTION OF HEAT RESISTANT PANS AND UTENSILS COATED WITH ENAMELS AND/OR OTHER NON-METALLIC MATERIALS AND CORRESPONDING ALUMINOUS METAL ARTICLES

Heinrich Zoller, Benken, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed June 8, 1971, Ser. No. 150,914

Claims priority, application Switzerland, June 9, 1970, 8615/70

Int. Cl.[2] C22C *21/12*

U.S. Cl. 428—35 1 Claim

1. A coated aluminous metal article, such as for example a cooking utensil for instance a pan, with good heat resistance, comprising in combination,

a shaped metal article composed of an AlCu-Ni alloy with a content of percentages by weight of from 1.2 to 2.3 Cu, from 0.3 to 1.2 Ni, from 0.15 to 1.2 Fe, up to 1.0 Mg, up to 0.6 Si, up to 0.4 Zn, wherein the content of Cr, Mn, V and W is less than 0.1, the content of Ag and Nb is below 0.3, the maximum content of Ce is 0.01, and the remainder is aluminum, and

a protective coating of heat resistant inorganic enamel composed of boric acid, potassium hydroxide, potassium silicate, titanium oxide and a commercial frit and of a heat resistant synthetic material disposed directly adjacent the external surface of said shaped article, wherein said synthetic material is polytetrafluoroethylene.

3,983,275

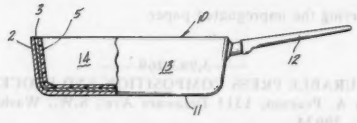
COOKWARE PREPARED FROM HIGH TEMPERATURE ALUMINUM BASE ALLOYS

Joseph Winter, New Haven, Conn.; William C. Setzer, Creve Coeur; Douglas L. Graham, Ballwin, both of Mo., and Michael J. Pryor, Woodbridge, Conn., assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Continuation-in-part of Ser. No. 492,444, July 29, 1974, abandoned, which is a division of Ser. No. 351,640, April 16, 1973, abandoned. This application May 2, 1975, Ser. No. 573,954

Int. Cl.[2] A47J *36/02*; B32B *15/04*, *15/20*

U.S. Cl. 428—35 7 Claims



1. A cooking utensil shaped by a process involving metal deformation from a composite, said composite comprising a high-temperature, substantially magnesium-free aluminum base alloy component exhibiting improved formability, said aluminum base alloy component comprising from about 0.1–0.7% zirconium, 0.1–0.4% chromium, 0.3–1.5% manganese and the balance essentially aluminum and having at least a first and second major surface, said second major surface being in opposing relationship to said first major surface; an oxide layer formed over substantially all of said first major surface, said oxide layer comprised of alumina and having a thickness of at least 50 Angstroms; a glass or ceramic component comprising a coating of a glass or ceramic frit covering from about 40 to 100% of the surface area of said first major surface, said glass or ceramic component being bonded to said aluminum base alloy component in a glass or ceramic-to-metal bond involving said oxide layer; and a heat resistant organic resin coating over said glass or ceramic component and said first major surface of said aluminum base alloy component, said heat resistant organic resin component comprising a cooking surface.

3,983,276

ADHESIVE TAPE

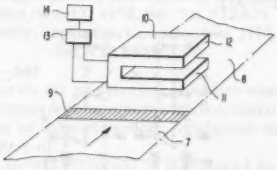
Yasuo Matsumoto, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 30, 1975, Ser. No. 627,414

Claims priority, application Japan, Oct. 30, 1974, 49-125034

Int. Cl.[2] C09J *7/02*

U.S. Cl. 428—40 15 Claims



1. An adhesive tape for use in joining photographic supports which are dried using high frequency radiation, said adhesive tape comprising a support, a magnetic layer on one side of said support, the other side of said support showing adhesion to a

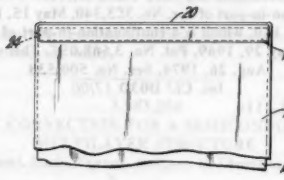
photographic emulsion layer, and an adhesive layer on said magnetic layer.

3,983,277

DECORATING PLACEMAT CONSTRUCTION WITH A GRAPHIC PATTERN

Don Ackerman, Scotch Plains, N.J., and Robert Ira Schwartztol, Miami, Fla., assignors to PerCare, Inc., Roselle, N.J.

Continuation-in-part of Ser. No. 434,694, Jan. 18, 1974, Pat. No. 3,920,870. This application July 9, 1975, Ser. No. 594,537
The portion of the term of this patent subsequent to Nov. 18, 1992, has been disclaimed.
Int. Cl.² B32B *3/02, 3/04;* B65D *27/14, 65/18*
U.S. Cl. 428—46 7 Claims



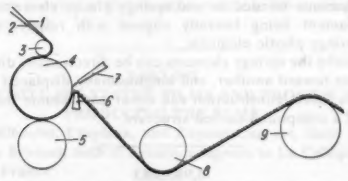
1. In combination in a placemat, a compliant backer sheet, a clear overlay sheet, means securing said overlay sheet and said backer sheet about less than all the periphery thereof, graphic bearing sheet means disposed between said backer and overlay sheet with said graphics disposed toward said overlay sheet, flap member means secured to said clear overlay sheet about the portion of the periphery thereof where said overlay sheet and said backer are not secured, and double sided adhesive strip means secured to the surface of one of said compliant backer sheet remote from said clear overlay sheet and said flap member, and disposed in proximate relation to said flap member.

3,983,278

METHOD OF MAKING A THERMOPLASTIC PILE SHEET

Glynn Arthur Wardle, Ramsbottom, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Sept. 16, 1974, Ser. No. 506,541
Claims priority, application United Kingdom, Sept. 27, 1973, 45226/73
Int. Cl.² B29C *17/00*
U.S. Cl. 428—92 10 Claims



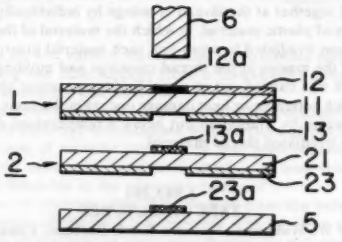
1. In a method of making a pile-surfaced product having a pile of a thermoplastic polymer integrally attached to a layer of the same thermoplastic polymer, which method includes feeding a thermoplastic sheet and a backing substrate between two cooperating surfaces one of which is heated with the thermoplastic sheet facing the heated surface, the heated surface having a temperature sufficient to melt the thermoplastic sheet to bond said sheet and said backing substrate and to cause adhesion between the thermoplastic sheet and the heated surface, withdrawing said backing substrate and said thermoplastic sheet from said heated surface to form a pile of fibrils or tufts, on said sheet separating said pile from said heated surface and cooling said backing substrate, said pile and said thermoplastic layer, the improvement comprising: heating said thermoplastic layer from the side thereof having said backing substrate bonded thereto, said heating being for a time and to a temperature sufficient to improve abrasion resistance of the pile as measured by a standard abrasion test and as compared with a pile surfaced product made by a process the same as claimed herein but lacking only the step of heating a pile sheet from the substrate side, and said heating leaving the pile uncollapsed, said substrate being of a material adapted to bond to said thermoplastic sheet with heat and pressure and being otherwise unaffected by temperature of the process.

3,983,279

MULTIPLE HEAT-SENSITIVE COPYING MEDIUM

Hiromu Matsushita, Habikino; Takashi Yamahata, Koriyama, and Hiroshi Kakimoto, Kyoto, all of Japan, assignors to General Company, Ltd., Osaka, Japan

Filed July 15, 1974, Ser. No. 488,456
Int. Cl.² B41M *5/10*
U.S. Cl. 428—101 8 Claims

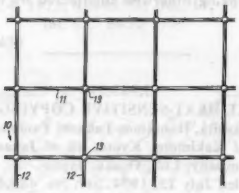


4. A multiple heat-sensitive copying medium comprising a double-sided heat-sensitive member comprising a substrate of good thermal conductivity having on one side thereof a heat-sensitive color forming layer selected from the group consisting of a combination of an iron salt of a fatty acid having a long chain and a phenol, a combination of a metal salt of a fatty acid having a long chain and a metal chelating agent, a combination of a phenol and a photochromic benzoindolinospiropyran compound, a combination of a leuco dye and a phenol; and on the other side thereof a heat-sensitive transferring layer containing a heat-sensitive color forming material and a binder of resinous material comprising a wax or wax-like material and an oil, at least one intermediate member comprising a substrate of good thermal conductivity having on one side thereof a transferred image-receiving agent layer and on the other side thereof a heat-sensitive transferring layer containing a heat-sensitive color forming material and a transferred image-receiving member comprising a substrate having on one side a transferred image-receiving agent layer, said intermediate member being disposed between said double-sided heat-sensitive member and said transferred image-receiving member so that said transferred image-receiving agent layer of said intermediate member and said heat-sensitive transferring layer of said double-sided heat-sensitive member, and said heat-sensitive transferring layer of said intermediate member and said transferred image-receiving agent layer of said transferred image-receiving member are maintained in face to face relationship, respectively.

3,983,280
NETTING

Anthony Bramley, Gosford House, Gosford, Kidlington, Oxfordshire, and Robin J. T. Clabburn, 1, Stonefield Drive, Highworth, Wiltshire, both of England

Continuation of Ser. No. 374,619, June 28, 1973, abandoned. This application Mar. 25, 1975, Ser. No. 561,690
Claims priority, application United Kingdom, July 7, 1972, 32024/72
Int. Cl.² B32B 5/12
U.S. Cl. 428—107 11 Claims

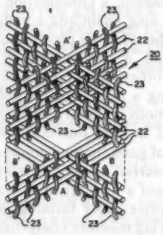


1. Netting comprising longitudinal threads of thermoplastic material and transverse threads of thermoplastic material joined together at the thread crossings by individually molded masses of plastic material, in which the material of the threads has been irradiated to cross-link such material prior to molding of the masses at the thread crossings and molding of such masses was carried out at a molding temperature above that at which softening or heat damage occurs in the same material not treated by irradiation but below a temperature damaging to the irradiated thread material.

3,983,281
TAPE STRUCTURES

Alfred W. Wakeman, Madison Road, Durham, Conn. 06422

Continuation-in-part of Ser. No. 379,264, July 16, 1973, abandoned, which is a division of Ser. No. 159,796, July 6, 1971, Pat. No. 3,751,760, which is a continuation-in-part of Ser. No. 859,619, Sept. 22, 1969, abandoned, which is a division of Ser. No. 379,265, July 16, 1973, Pat. No. 3,851,353. This application Apr. 9, 1975, Ser. No. 566,295
Int. Cl.² B32B 5/12
U.S. Cl. 428—112 7 Claims



1. A flexible tape for joining mating edges of adjacent panel members, said tape comprising:

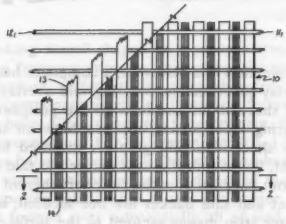
two sets of flexible, spaced connector strands running crosswise of the longitudinal axis of the tape, the strands in one set intersecting and crossing those of the other set in alternation to form a longitudinally extended X-like configuration having four legs projecting respectively outwardly from the axis of intersection and having free outer ends to define four open-sided pockets running lengthwise of the tape in quadrantial arrangement about the tape axis;

means integrating adjacent connector strands along each leg to form therein a porous matted portion extending marginally along but spaced outwardly from said axis of intersection to leave an open center in which the two sets of connector strands in crossing said axis are free to shift relative to each other within the limits defined by said porous matted portions of said legs.

3,983,282
FABRIC CONSTRUCTIONS USEFUL AS BUILDING BASES IN FORMING COMPOUND-CURVED STRUCTURES

William H. Seemann, III, 1002 Third St., New Orleans, La.

Continuation-in-part of Ser. No. 353,340, May 15, 1972, Pat. No. 3,895,160, which is a continuation-in-part of Ser. No. 829,067, May 29, 1969, Pat. No. 3,668,051. This application Aug. 26, 1974, Ser. No. 500,538
Int. Cl.² D03D 17/00
U.S. Cl. 428—114 10 Claims



1. In a fabric construction, constituting an article of manufacture useful for covering and assuming a compound-curved shape wherein is included the combination of at least two plies, characterized as outer plies of flexible material between which is sandwiched a series of spaced-apart, parallel aligned, springy plastic elements of elongate shape, each element constructed with fibers impregnated with resin, cured, and thereby reinforced to form a semi-rigid or rigid material, the outer plies and the springy plastic elements being bonded one to the other to form the sandwich structure, the voids between adjacent springy plastic elements containing fibers in the form of yarns or rovings,

the improvement wherein

said plies consist of parallel aligned continuous pliable filaments bonded to said springy plastic elements, each filament being laterally aligned with respect to said springy plastic elements,

whereby the springy elements can be directionally displaced one toward another, and longitudinally displaced so that the fabric construction can cover and assume the shape of a compound-curved structure.

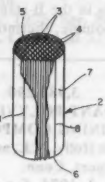
3,983,283
HONEYCOMBED STRUCTURES HAVING OPEN-ENDED CELLS FORMED BY INTERCONNECTED WALLS WITH LONGITUDINALLY EXTENDING DISCONTINUITIES

Rodney D. Bagley, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 18, 1974, Ser. No. 452,362
Int. Cl.² B32B 3/12
U.S. Cl. 428—116 24 Claims

1. A monolithic honeycombed structure of sintered material comprising a plurality of interconnected walls forming open-ended cells extending longitudinally through the structure, said walls including a plurality of discontinuities extending

longitudinally through the entire length of the structure and transversely through said walls, said discontinuities having a



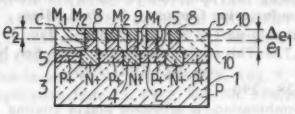
width substantially less than the distance between junctions of said interconnected walls.

3,983,284

FLAT CONNECTION FOR A SEMICONDUCTOR MULTILAYER STRUCTURE

Michel Croset, Paris, France, assignor to Thomson-CSF, Paris, France

Continuation of Ser. No. 365,519, May 31, 1973, abandoned. This application Mar. 21, 1975, Ser. No. 560,591
Claims priority, application France, June 6, 1972, 72.19940
Int. Cl.[2] B32B *3/00*; C23B *1/08*; H01L *27/10*
U.S. Cl. 428—195 2 Claims



1. A multilayer interconnection pattern, for interconnecting at least a first element to a second element, said first and second element being integrated over the same substrate, said interconnection comprising at least a flat combination including at least a first layer of tantalum which is oxidizable by a thermal treatment deposited upon said first and second elements, and a second conductive layer of aluminum which is non-oxidizable by said thermal treatment and deposited between said first and second elements and having a first thickness and at least a third layer of a dielectric oxide provided from oxidation of said first layer of tantalum by said thermal treatment and having said first thickness; said third and second layers forming a flat structure suitable for making said interconnection.

3,983,285

COMPOSITE POLYESTER FILMS AND PROCESS FOR PRODUCING THE SAME

Robert Riboulet, Crepieux, and Eugene Charvet, Saint Maurice de Beynost, both of France, assignors to La Cellophane, Paris, France

Continuation-in-part of Ser. No. 332,183, Feb. 3, 1973, Pat. No. 3,900,653. This application June 4, 1974, Ser. No. 476,284
Claims priority, application France, Feb. 16, 1972, 72.05115; June 8, 1973, 73.20883
The portion of the term of this patent subsequent to Aug. 19, 1992, has been disclaimed.
Int. Cl.[2] B32B *33/00*, *27/18*, *27/36*
U.S. Cl. 428—212 10 Claims

1. A magnetic recording tape comprising a film support and a layer of a magnetic material deposited on a surface thereof wherein said film support is a composite polyester laminate consisting essentially of:

a. a first polyester film layer formed from the polycondensation of dimethyl terephthalate with ethylene glycol in the presence of an ester interchange and polycondensation catalyst system the residue of which is at least substantially insoluble in the polyester melt, and

b. a second polyester film layer formed from the polycondensation of dimethyl terephthalate with ethylene glycol in the presence of an ester interchange and polycondensation catalyst system the residue of which is at least substantially soluble in the polyester melt wherein said layer (a) containing the insoluble catalyst residue comprises from 5 to 25 percent by weight of the composite polyester laminate support and layer (b) containing the soluble catalyst residue comprises from 95 to 75 percent by weight of the composite polyester laminate;

said second polyester film layer (b) having a coefficient of rugosity of less than 0.5μ and the coefficient of friction between said first layer (a) and said second layer (b) being less than 0.7 and wherein said magnetic material is deposited on the second polyester film layer.

8. In a process for preparing a magnetic recording tape having a film support having a layer of magnetic material

deposited on one surface thereof, the improvement comprising forming the film support from a co-extruded polyester laminate consisting essentially of:

a. a first polyester film layer formed from the polycondensation of dimethyl terephthalate with ethylene glycol in the presence of an ester interchange and polycondensation catalyst system the residue of which is at least substantially insoluble in the polyester melt, and

b. a second polyester film layer formed from the polycondensation of dimethyl terephthalate with ethylene glycol in the presence of an ester interchange and polycondensation catalyst system the residue of which is at least substantially soluble in the polyester melt wherein said layer (a) containing the insoluble catalyst residue comprises from 5 to 25 percent by weight of the composite polyester laminate support and layer (b) containing the soluble catalyst residue comprises from 95 to 75 percent by weight of the composite polyester laminate;

said second polyester film layer having a coefficient of rugosity of less than 0.5μ and the coefficient of friction between said first layer and said second layer being less than 0.7 and depositing said layer of magnetic material on said second polyester film layer.

3,983,286

METHOD OF FIXING COPPER SALTS TO ARTICLES OF SYNTHETIC POLYMERS

Andre Arsac, Millery, Vernaison, France, assignor to Rhone-Poulenc-Textile, France

Continuation-in-part of Ser. No. 353,730, April 20, 1973, Pat. No. 3,940,533. This application Mar. 4, 1975, Ser. No. 555,253
Claims priority, application France, Mar. 18, 1974, 74.09384
Int. Cl.[2] D04B *1/00*; B05D *5/12*
U.S. Cl. 428—225 11 Claims

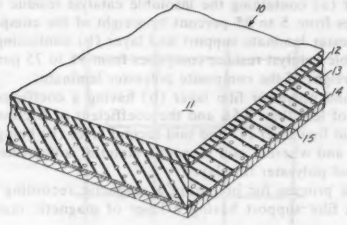
1. In a process of fixing a copper salt on an article of synthetic polymers wherein the said article is subjected to the action of hydrogen sulfide under a positive gage pressure and then to the action of a copper salt, the method of improving the adhesion of the salt to the article which comprises treating the article with the salt in the presence of at least 0.1 percent by weight of a polyphenol.

3,983,287

COMPRESSIBLE PRINTING BLANKET

Charles G. Goossen, Hudson, Wis., and Stanley G. Peterson, Minneapolis, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 22, 1971, Ser. No. 200,729
Int. Cl.[2] B41N 9/00
U.S. Cl. 428—241 3 Claims



1. A thin strong printing blanket especially suited for use in offset llighography comprising in laminated combination:

an intermediate compressible layer of about —40 mils thick comprised of polyurethane elastomer having up to about 40 percent uniformly distributed voids and at least 5×10^{-3} cubic inches of void per square inch of blanket surface, said polyurethane elastomer having a Shore A-2 hardnes of 75–90 when void free, said voids characterized by having diameters in the range of 40 to 100 microns, a shape corresponding to minute spherical rigid-walled frangible glass bubbles, and containing the broken walls of said bubbles; and having permanently bonded to either major surface of said compressible layer;

an ink transfer layer about 5 mils thick comprised of acrylonitrile/butadiene copolymer; and

a foundation sheet about 20 mils thick comprised of at least one thickness of a strong woven fabric that has been integrated with an adhesive resin.

3,983,288

FIBERS AND FABRICS CONTAINING OPTICAL BRIGHTENING AGENTS

Derek D. Chapman, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 4, 1974, Ser. No. 520,330
Int. Cl.[2] B32B 7/00; D02G 3/00
U.S. Cl. 428—260 24 Claims

1. A nonmetallic synthetic fiber having incorporated therein or thereon from 0.01% to 1% by weight of an optical brightener comprising a quaternary salt having a pyrido [1,2-a] indolium salt nucleus.

3,983,289

ELECTRICALLY INSULATING PREPREG

Syunichiro Nishizaki; Hiroshi Teratani; Osamu Fujisawa; Jiro Fukushima, all of Amagasaki; Makoto Tokizawa, Kawasaki; Nobukatsu Wakabayashi, Kawasaki, and Takashi Saito, Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries Ltd. and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan

Filed Apr. 9, 1974, Ser. No. 459,316
Claims priority, application Japan, Apr. 9, 1973, 48-40185; May 25, 1973, 48-58397; Aug. 2, 1973, 48-86974
Int. Cl.[2] B32B 7/00, 17/02
U.S. Cl. 428—268 10 Claims

1. An electrically insulating prepreg, which comprises:

a resin composition of an alicyclic epoxy compound prepared by the epoxidation of an alkadiene alcohol ester of an alicyclic polybasic carboxylic acid, wherein said alkadiene alcohol is 2,7-octadienol-1 or 1,7-octadienol-3, a latent curing agent of a Lewis acid amine complex, and a fibrous solid substrate or sheet like solid substrate, wherein said resin composition once it has been applied to said substrate is in the B-stage cured condition and is thereby acetone soluble, thermoplastic and non-tacky.

3,983,290

FIRE RETARDANT POLYVINYL CHLORIDE CONTAINING COMPOSITIONS

Robert G. Elcik, Mount Holly, N.J., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Sept. 3, 1974, Ser. No. 502,590
Int. Cl.[2] B32B 15/00, 17/00
U.S. Cl. 428—285 8 Claims

1. A vapor barrier construction comprising a self-supporting film which is adhesively laminated to a fiberglass batting, said self-supporting film comprising an intimate admixture of: (1) a vinyl chloride polymer; (2) a chlorinated polyethylene having a chlorine content of from about 35% to about 45%; (3) a phosphate ester plasticizer; (4) an antimony trioxide flame retardant having a particle size of below about 5 microns; (5) a magnesium hydroxide filler having a particle size such that at least 99% of the particles have a diameter of less than 45 microns; and, (6) zinc borate.

3,983,291

SILANOL-CONTAINING URETHANE DISPERSIONS

Joe H-S Chang, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 538,153, Jan. 2, 1975, Pat. No. 3,941,733. This application Dec. 4, 1975, Ser. No. 637,813
Int. Cl.[2] C08J 3/10
U.S. Cl. 428—290 10 Claims

1. In combination, a substrate and a coating thereon of poly(urethane-urea) said poly(urethane-urea) being characterized in having a poly(urethane-urea) backbone containing interspersed bound water-solubilizing ionic groups pendent from said backbone and in being at least partially siloxane cross-linked by mutually interreacted silyl groups.

3,983,292

PRESSURE SENSITIVE RECORDING PAPERS

Toranosuke Saito, Kobe, and Daiichiro Tanaka, Arao, both of Japan, assignors to Sanko Chemical Company Ltd., Japan

Continuation of Ser. No. 265,484, June 23, 1972, abandoned. This application Aug. 1, 1974, Ser. No. 493,834
Claims priority, application Japan, Aug. 27, 1971, 46-65129; Sept. 23, 1971, 46-73791; Mar. 29, 1972, 47-30665
Int. Cl.[2] B41M 5/12
U.S. Cl. 428—306 3 Claims

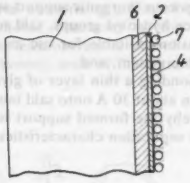
1. Pressure sensitive recording paper which comprises a two-component system in which one component is paper coated with a color developer composition and the other component is a recording paper having an encapsulated dyestuff layer, said dyestuff consisting essentially of a proton sensitive dyestuff of the crystal violet lactone type, and said developer composition contains a salicylic acid derivative selected from the group consisting of: aluminum 3-phenyl-5-(α, α-dimethyl-benzyl) salicylate, zinc 3-phenyl-5-(α, α-dimethyl-benzyl), salicylate, zinc 3-tert-butyl-5 methyl-salicylate, zinc 3-phenylsalicylate, zinc 3-cyclohexylsalicylate, zinc 3-(α, α-dimethylbenzyl)-5-methylsalicylate, zinc 3, 5-di-tert-butylsalicylate zinc 3, 5-dicyclohexyl-salicylate, zinc 3-cyclohexyl-5-(α, α-dimethyl-benzyl) salicylate, zinc 3,5-di (α-methylbenzyl) salicylate, zinc 3-(α-methylbenzyl)-5-(α, α-dimethylbenzyl) salicylate, zinc 3,5-di(α, α-dimethylbenzyl) salicylate, a mixture of zinc 3-cyclohexyl-5-(α, α-dimethyl-benzyl) salicylate and zinc 3,5-di (α, α-dimethylbenzyl) salicylate.

3,983,293

MOLD FOR FORMING GLASS ARTICLES

Keishi Ohuchi, Sagamihara; Kenzo Matsui, and Keizo Tamai, both of Yokohama, all of Japan, assignors to Toyo Kohan Co., Ltd., Tokyo, Japan

Filed Aug. 6, 1975, Ser. No. 602,309
Int. Cl.² B32B 5/30
U.S. Cl. 428—306 6 Claims



1. A mold for use is molding glass articles which comprises a porous layer lining on the inner surface of a metal mold, said porous layer being composed of a glass or ceramic material having a melting point higher than 400°C. and said porous layer having a heat conductivity not higher than 0.005 Joul/cm.sec.°K as measured at room temperature, a thickness of 40 to 3,000 microns and a porosity of 30 to 70 percent.

3,983,294

METHOD OF MAKING PLASTIC FOAM LAMINATES AND PRODUCT FORMED THEREBY

Jagadish C. Goswami, New City, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 496,228, Aug. 9, 1974. This application June 23, 1975, Ser. No. 588,103
Int. Cl.² B32B 3/26
U.S. Cl. 428—310 29 Claims

13. A plastic film laminate which comprises:

a. a base; and

b. a plastic film attached to said base, said film comprising a suspension copolymer of vinyl chloride, vinyl acetate and bis (hydrocarbyl) vinylphosphonate and a blowing agent.

3,983,295

RIGID OR SEMIRIGID FOAMS AND PROCESS OF MAKING THEM

Angelo Murer, Brussels, and Mario Borsatti, Overijse, both of Belgium, assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 298,454, Oct. 17, 1972, abandoned. This application Nov. 7, 1974, Ser. No. 521,926
Int. Cl.² B29D 27/04
U.S. Cl. 428—315 29 Claims

1. A method for preparing a heat recoverable thermoelastic self-skinned cellular plastic structure consisting essentially of:

A. preparing a vinyl chloride composition, wherein said composition is a plastisol or a pregelified dry-blend of:

1. a dispersion type vinyl chloride polymer;

2. a non-volatile polymerizable polyfunctional monomer selected from the group consisting of allyl and vinyl monomers;

3. a peroxide catalyst; and

B. depositing said composition in an open mold cavity;

C. heating said vinyl chloride composition at a rate of about 10°C. to about 30°C./minute to at least the temperature at which said monomer rapidly cures and expansion of the reaction mass commences in said mold cavity wherein the vinyl chloride composition is free to expand in at least one direction.

17. The product of claim 1.

3,983,296

MODIFIERS FOR PVC FOAM, PROCESS FOR EXTRUDING MODIFIED PVC FOAM AND MODIFIED PVC FOAM COMPOSITIONS

Marshall T. Purvis, and R. Peter Grant, both of Newtown, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Mar. 22, 1974, Ser. No. 453,627
Int. Cl.² B29D 27/00
U.S. Cl. 428—315 2 Claims

1. A process for extruding a foamed product at high efficiency and with smoother surfaces at a given throughput and concentration of modifier comprising introducing a composition comprising 100 parts by weight of polyvinyl chloride or copolymers of vinyl chloride containing up to 20% by weight of other monovinylidine compounds, a blowing agent and about 1 to 25 parts by weight of a modifier system comprising:

a first core-shell polymer having a hard shell polymerized from a shell-forming monomer system comprised of, in major part, at least one C_1 to C_4 alkyl methacrylate, having a molecular weight (M_r) above 1.5 million, polymerized in the presence of, but substantially ungrafted to, a crosslinked core polymerized from a core-forming monomer system comprised of, in major part, C_2 to C_8 alkyl acrylate, and about 0.1 to 5 weight percent, based on C_2 to C_8 alkyl acrylate, of a glycol dimethacrylate crosslinking agent, the weight ratio of shell to core being about 40:60 to 75:25; and

a second core-shell polymer having a shell polymerized from a shell-forming monomer system comprised of, in major part, at least one C_1 to C_4 alkyl methacrylate, polymerized in the presence of, but substantially ungrafted to, a core polymerized from a monomer or monomer mixture comprising, in major part, at least one C_1 to C_8 alkyl acrylate;

into a plasticating extruder and extruding said composition at a temperature of about 250°–400°F. through a die to foam said smoother surfaced product.

3,983,297

PRESSURE-SENSITIVE ADHESIVE TAPE OR DRAPE

Tomoyoshi Ono, Hino, and Yoshihiko Matsuguma, Hachioji, both of Japan, assignors to Teijin Limited, Osaka, Japan

Division of Ser. No. 367,474, June 6, 1973. This application Oct. 24, 1974, Ser. No. 517,644
Claims priority, application Japan, June 14, 1972, 47-58582; July 26, 1972, 47-74089
Int. Cl.² C08F 218/18, 220/02, 222/14; C09J 7/02
U.S. Cl. 428—355 11 Claims

1. An adhesive tape or drape comprising a base sheet and formed thereon, a layer of a pressure-sensitive adhesive comprising as a main constituent a copolymer comprising

1. 94 to 98 mol% based on the total of components (1) and (2) of at least one alkyl acrylate monomer with the alkyl group containing 1 to 14 carbon atoms, the average number of the carbon atoms being 4 to 12, or a mixture of said alkyl acrylate with another monomer selected from the group consisting of methyl methacrylate, vinyl acetate and mixtures thereof in a mol ratio of said alkyl acrylate to said other monomer of at least 5 to 1,

2. 2 to 6 mol% based on the total of components (1) and (2) of a monomer selected from the group consisting of acrylic acid, methacrylic acid, and mixtures thereof, and

3. 0.002 to 0.05 mol% based on the total of components (1) and (2) of a polyfunctional compound copolymerizable with the monomers (1) and (2) and having at least two non-conjugated carbon-to-carbon double bonds per molecule with the proviso that the amounts of component (1) and component (2) totals 100 mol%; said copolymer prepared by copolymerizing components (1), (2), and (3) by solution polymerization or emulsion polymerization.

3,983,298

POLYORGANOSILOXANE PRESSURE SENSITIVE ADHESIVES AND ARTICLES THEREFROM

James R. Hahn, Midland, and James A. Vallender, Freeland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Apr. 18, 1975, Ser. No. 569,256
Int. Cl.[2] B32B 9/04; C08L 83/04
U.S. Cl. 428—355 14 Claims

1. A composition suitable for use as a pressure sensitive adhesive, obtained by mixing components consisting essentially of

a. from 50 to 60 parts by weight of a solid, benzene soluble resin copolymer consisting essentially of

$R_3SiO_{1/2}$ units and $SiO_{4/2}$ units

where R is a monovalent hydrocarbon radical containing no more than six carbon atoms, there being from 0.6 to 0.9 inclusive

$R_3SiO_{1/2}$ units for every $SiO_{4/2}$ units,

at least 95 percent of all R radicals in (a) being methyl and the total number of R radicals in (a) that have olefinic unsaturation being no more than 0.5 percent, preferably zero percent, of all R radicals in (a),

b. from 40 to 50 parts by weight of an essentially cyclic free polydiorganosiloxane of the average formula

$$CH_2{=}CHR''_2SiO(R'_2SiO)_nSiR''_2CH{=}CH_2$$

where R′ is selected from the group consisting of methyl, ethyl, propyl, and phenyl, at least 95 percent of all R′ radicals being methyl, R″ is any R′ as defined above and *n* has an average value such that the viscosity of the polydiorganosiloxane (b) has a value of from 20,000 to 100,000 centipoise at 25°C., the total of (a) and (b) being 100 parts by weight,

c. an amount of an organopolysiloxane compatible with the mixture of (a) and (b) and having an average unit formula

$$R'''_aH_bSiO_{\frac{4-a-b}{2}}$$

where R‴ is any R′ radical as defined above, *a* has a value of from 1.00 to less than 2.00, *b* has a value of from 0.05 to 1.00, the sum of *a* plus *b* being from 1.10 to less than 3.00, there being an average of greater than two silicon bonded hydrogen atoms per molecule of (c), no silicon atom bearing more than one silicon bonded hydrogen atom and the amount of (c) present being sufficient to provide from 1.0 to 20.0 silicon bonded hydrogen atoms for every olefinically unsaturated radical in the total of (a) plus (b) and,

d. a platinum containing catalyst in sufficient quantity to provide at least 0.1 part by weight of platinum for every one million parts by weight of the combined weight of (a), (b), and (c).

3,983,299

BONDED CARBOHYDRATE STATIONARY PHASES FOR CHROMATOGRAPHY

Frederick E. Regnier, West Lafayette, Ind., assignor to Purdue Research Foundation, W. Lafayette, Ind.

Continuation-in-part of Ser. No. 447,640, March 4, 1974, abandoned. This application Dec. 30, 1974, Ser. No. 537,197
Int. Cl.[2] B32B 17/02
U.S. Cl. 428—405 21 Claims

1. A process for producing a bonded support for a chromatographic system, said process comprising:

providing a porous inorganic support structure having available surface hydroxyl groups, said support structure having dimensions suitable for use as a support in a chromatographic system;

bonding an organo silane onto said inorganic support structure; and

covalently bonding a thin layer of carbohydrate material of less than about 30 A onto said organo silane whereby the formed support is mechanically stable with carbohydrate separation characteristics and is hydrophilic.

17. A process for producing a bonded support for a chromatographic system, said process comprising:

providing a porous inorganic support structure having available surface hydroxyl groups, said support structure having dimensions suitable for use as a support in a chromatographic system; and

covalently bonding a thin layer of glycidoxyl-propyl silane of less than about 30 A onto said inorganic support structure whereby the formed support is mechanically stable with good separation characteristics and is hydrophilic.

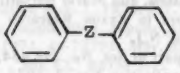
3,983,300

ARTICLE COMPRISING AN ADHEREND WITH A THERMOPLASTIC POLYMER INCLUDING —$ARSO_2$— REPEATING UNITS ADHERING THERETO

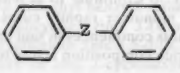
Michael Edward Benet Jones, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 39,880, May 22, 1970, abandoned, which is a division of Ser. No. 320,508, Oct. 31, 1963. This application Dec. 18, 1972, Ser. No. 315,904
Int. Cl.[2] B32B 15/08, 17/10, 27/28
U.S. Cl. 428—411 11 Claims

1. An article comprising an adherend with a thermoplastic polymer adhering thereto, said polymer consisting essentially of (1) repeating units having the structure —Ar—SO_2— or (2) repeating units having the structure —Ar—SO_2— and repeating units having the structure —Ar—CO—, where Ar is selected from (a) a divalent aromatic radical obtained by removal of two aromatically bound hydrogen atoms from a compound selected from the group consisting of benzene, condensed polynuclear aromatic hydrocarbons containing not more than two aromatic rings, diphenyl, and compounds having the structure



where Z is —O— or —S—, and where said compound contains two aromatic rings one of said hydrogen atoms being removed from each ring and (b) substituted derivatives of said divalent aromatic radicals in which at least one of the remaining aromatically bound hydrogen atoms of said divalent radical is substituted by a monovalent radical selected from the group consisting of halogen atoms, alkyl groups containing from 1 to 4 carbon atoms and alkoxy groups containing from 1 to 4 carbon atoms, there being not more than two such monovalent radical substituents on any one aromatic ring of said divalent aromatic radical, at least some of the Ar units being a radical derived from a compound of said structure



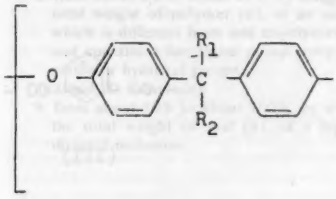
or said substituted derivatives thereof.

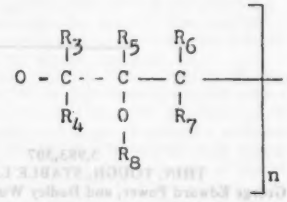
3,983,301
FILM BASE MATERIAL

Robert Stanley Cook; Keith Reid Tatchell, and Kenneth Archibald Cockerton, all of Ilford, England, assignors to Ilford Limited, England

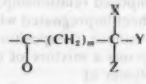
Filed May 16, 1974, Ser. No. 470,676
Claims priority, application United Kingdom, May 16, 1973, 23402/73
Int. Cl.² G03C 1/80; B32B 27/36
U.S. Cl. 428—413 6 Claims

1. Film base material comprising a film of synthetic linear polyester of hydrophobic character having superimposed thereon adherent to at least one entire side of said film a layer which comprises a phenoxy resin of the formula





wherein each of R_1 through R_7 is hydrogen, lower alkyl or cyclohexyl, from 50 to 100% of the R_8 groups in the phenoxy resin represent the acyl radical of the formula



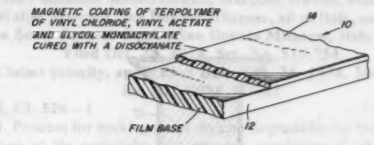
wherein m is 0 or an integer from 1 to 6, at least one of X, Y and Z is chlorine, bromine or cyano, and the other of X, Y and Z are each hydrogen, bromine or chlorine, any balance of the R_8 groups in the phenoxy resin being hydrogen, and n is at least 50.

3,983,302
MAGNETIC RECORDING MEDIUM

Richard S. Zucker, Newtown, Conn., assignor to CBS Inc., New York, N.Y.

Continuation-in-part of Ser. No. 249,436, May 1, 1972, abandoned, which is a continuation of Ser. No. 73,428, Sept. 18, 1970, abandoned. This application Aug. 20, 1973, Ser. No. 389,834
Int. Cl.² H01F 10/02
U.S. Cl. 428—425 11 Claims

1. A magnetic recording medium comprising a backing material and an adherent coating thereon, said coating comprising magnetic particles dispersed in a resinous binder, said binder containing a polyurethane derived from a terpolymer and a diisocyanate, said terpolymer containing vinyl chloride, vinyl acetate, and a third monomer selected from the group consisting of glycol monoacrylate and glycol monomethacrylate, said terpolymer containing 51 to 94% by weight of vinyl

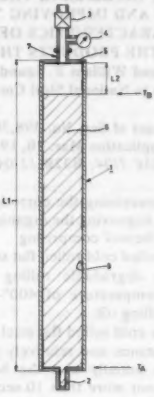

MAGNETIC COATING OF TERPOLYMER OF VINYL CHLORIDE, VINYL ACETATE AND GLYCOL MONOACRYLATE CURED WITH A DIISOCYANATE
14
10
FILM BASE
12

chloride, 16 to 2% by weight of vinyl acetate, and 33 to 4% by weight of said third monomer.

3,983,303
METHOD OF MANUFACTURING ARTICLES FROM METAL COATED WITH A ZIRCONIUM NITRIDE LAYER

Udo Klaus Paul Biermann; Brian Lynch, and Willibrordus Maria van de Wijgert, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 27, 1975, Ser. No. 562,495
Claims priority, application Netherlands, Apr. 16, 1974, 7405069
Int. Cl.² C23C 1/06; C23F 7/00
U.S. Cl. 428—457 4 Claims



1. A method of manufacturing a metal article having parts which are subject to the influence of a metal melt containing lead which attacks constituents of the metal parts comprising the steps subjecting an austenitic alloy containing at least 5% by weight of nickel and having at least on the surface thereof nitrogen to the action of a metal melt containing zirconium in molten lead at a temperature of at least 800°C to form a layer of zirconium nitride on said alloy which resists the corrosive action of lead.

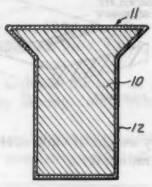
3,983,304
FASTENER WITH PROTECTIVE METAL-ORGANIC BASE COATING

Jagdish S. Sekhon, Fountain Valley, Calif., assignor to Hi-Shear Corporation, Torrance, Calif.

Division of Ser. No. 398,652, Sept. 19, 1973, and a continuation-in-part of Ser. No. 327,069, Jan. 26, 1973, abandoned. This application Jan. 26, 1976, Ser. No. 652,620
Int. Cl.² B32B 15/08
U.S. Cl. 428—460 11 Claims

1. A fastener having an exterior coating of material comprising a mixture of: powdered metallic substance from the group consisting of aluminum and molybdenum disulfide,

phenol-formaldehyde resin and metallic chromate in a carrier selected from the group consisting of lower alkyl alcohols, methy ethyl ketone and petroleum distillate from the group



consisting of xylene and toluene, and mixtures thereof, said material, upon application to a metal surface, drying to form a coating which is tough, adherent, smooth and corrosion resistant.

3,983,305

METHOD OF INCREASING THE CORROSION RESISTANCE AND IMPROVING THE ORGANIC COATING CHARACTERISTICS OF COLD ROLLED STEEL AND THE PRODUCTS THUS PREPARED

Gordon L. Peters, and William T. Saunders, both of Weirton, W. Va., assignors to National Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 398,308, Sept. 18, 1973, abandoned. This application Mar. 10, 1975, Ser. No. 557,171

Int. Cl.[2] C23F *7/04*; B32B *15/04*; B05D *3/02*

U.S. Cl. 428—467 26 Claims

1. A method of increasing the corrosion resistance of cold rolled flat steel and improving the organic coating characteristics of the surface thereof comprising

heat treating as rolled cold rolled flat steel having iron oxide and thermally degradable rolling oil on the surface thereof at a temperature of 400°–800°F. to thermally degrade the rolling oil,

the surface of the cold rolled flat steel having relatively low corrosion resistance and relatively poor organic coating characteristics initially and the heat treatment being continued for not more than 10 seconds until the corrosion resistance and the organic coating characteristics of the resulting heat treated steel are improved, and

immediately cooling the said heat treated steel to a temperature not greater thaan 200°F. to prevent further thermal degradation of the rolling oil, the surface of the resulting cooled heat treated steel having a residual film thereon containing iron oxide and thermally degraded rolling oil which imparts corrosion resistance and improved organic coating characteristics thereto.

3,983,306

COMPOSITE SHEET STRUCTURES

Werner Nielinger; Rolf Dhein; Ulrich Haberland; Dietrich Michael, and Karl-Heinz Hermann, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 22, 1974, Ser. No. 445,295

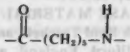
Claims priority, application Germany, Feb. 24, 1973, 2309420

Int. Cl.[2] B32B *27/32*, *27/34*

U.S. Cl. 428—474 5 Claims

1. Transparent composite sheet structures consisting essentially of at least one sheet of polyethylene directly bonded to at least one sheet of a copolyamide consisting essentially of

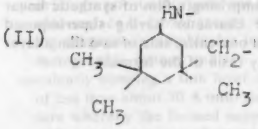
A. 85–98% by weight of units of the formula (I)

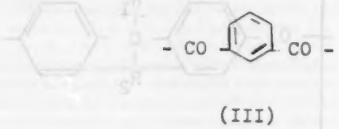


(I)

and of

B. 15–2% by weight of equimolar quantities of units of formulae II and III





(III)

3,983,307

THIN, TOUGH, STABLE LAMINATE

George Edward Power, and Dudley Wulfekotter, both of Cincinnati, Ohio, assignors to Formica Corporation, Cincinnati, Ohio

Filed Sept. 29, 1975, Ser. No. 617,929

Int. Cl.[2] B32B *21/06*, *27/04*

U.S. Cl. 428—503 13 Claims

1. A unitary heat and pressure consolidated laminated article comprising, in superinposed relationship,

A. at least one paper sheet impregnated witn a substantially completely cured resinous composition, which, in its uncured state, comprises a mixture of (a) and (b), said (a) comprising a polymer of

1. from about 75% to about 98%, by weight, based on the total weight of polymer (a), of a polymerizable acrylic monomer and

2. from about 2% to about 25%, by weight, based on the total weight of polymer (a), of an acrylic monomer which is different from and copolymerizable with (1) and contains a functional group comprising carboxyl, amide or hydroxyl groups,

and said (b) comprising

3. a thermosetting melamine/formaldehyde resin having a ratio of melamine to formaldehyde ranging from about 1 : 1.6 to about 1 : 2.5, respectively,

the ratio of melamine in said (b) to polymer (a) ranging from about 4 : 1 to about 0.5 : 1, respectively,

B. a decorative sheet, with its decorative side facing upwardly, impregnated with a substantially completely cured resinous composition which, in its uncured state, comprises a mixture of (c) and (d), said (c) comprising a polymer of

4. from about 75% to about 98%, by weight, based on the total weight of polymer (c), of a polymerizable acrylic monomer and

5. from about 2% to about 25%, by weight, based on the total weight of polymer (c), of a acrylic monomer which is different from and copolymerizable with (4)

and contains a functional group comprising carboxyl, amide or hydroxyl groups,

and said (d) comprising

6. a thermosetting melamine/formaldehyde resin having a ratio of melamine to formaldehyde ranging from about 1 : 1.6 to about 1 : 2.5, respectively,

the ratio of melamine in said (d) to polymer (c) ranging from about 4 : 1 to about 1 : 1, respectively, and

C. a clear, thermoset cross-linked resinous coating, directly applied to the upward face of said decorative sheet, comprising a composition, which, in its thermosetting, non-cross-linked state, comprises a mixture of (e) and (f), said (e) comprising a polymer of,

7. from about 75% to about 98%, by weight, based on the total weight of polymer (e), of a polymerizable acrylic monomer and

8. from about 2% to about 25%, by weight, based on the total weight of polymer (e), of an acrylic monomer which is different from and copolymerizable with (7) and contains a functional group comprising carboxyl, amide or hydroxyl groups,

and said (f) comprising

9. from about 10% to about 100%, by weight, based on the total weight of said (8), of a highly alkoxymethylated melamine.

3,983,308

PROCESS FOR MAKING DEGRADABLE POLYMERS AND DEGRADABLE POLYMERS OBTAINED THEREBY

Nicola Palladino, Monterotondo; Marcello Mazzei, Milan, and Walter Marconi, San Donato Milanese, all of Italy, assignors to Snam Progetti S.p.A., San Donato Milanese, Italy

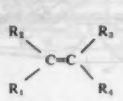
Filed Oct. 24, 1974, Ser. No. 517,754

Claims priority, application Italy, Oct. 24, 1974, 30484/74

Int. Cl.² C08F *110/02*

U.S. Cl. 526—1 **7 Claims**

1. Process for making polyethylene degradable by the direct action of the sun light said process consisting of adding to polyethylene an effective amount of a compound containing an ethylenic unsaturation having the formula



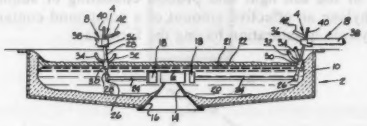
in which R_1 R_2 R_3 and R_4 are the same or different and are aromatic radicals, with the proviso that one or two of R_1 R_2 R_3 or R_4 may be selected from the group consisting of hydrogen, alkyl, cycloalkyl and arylalkyl.

3,983,309

PRIMARY ELECTRODE ARRANGEMENT FOR HIGH TEMPERATURE MELTING FURNACE

Duane Harold Faulkner, Cambridge City; Steven Douglas Sanford, Richmond, both of Ind., and Vaughn Charles Chenoweth, Hollansburg, Ohio, assignors to Johns-Manville Corporation, Denver, Colo.

Filed May 16, 1975, Ser. No. 578,439
Int. Cl.² C03B 5/02
U.S. Cl. 13—6 10 Claims



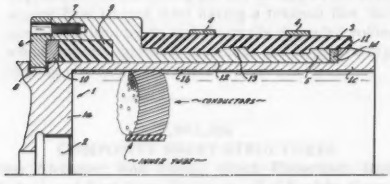
1. In a melting furnace comprising:
a. a vessel for containing molten material and unmelted batch on the surface of the molten material forming an interface,
b. an electrically conducting member located within said vessel, and
c. at least two electrically conducting primary electrodes made from a refractory metal highly susceptible to oxidation at elevated temperatures in an oxidizing atmosphere inside said vessel having their tips spaced radially about said electrically conducting member, the improvement comprising:
d. each primary electrode having a portion thereof exposed through the top surface of the molten material to the unmelted batch and other environment adjacent to the top surface of the molten material, and
e. each primary electrode having means around its exterior surface located where said electrode passes through said interface for cooling the electrodes in this vicinity to a temperature below that at which the material used to form said electrodes would rapidly oxidize in an oxidizing atmosphere.

3,983,310

CONNECTION BETWEEN A SOCKET AND A LIQUID COOLED CABLE

Horst Fischer, Osnabruck, Germany, assignor to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed Apr. 21, 1975, Ser. No. 569,929
Int. Cl.² H02G 15/22; H01B 7/34
U.S. Cl. 174—19 9 Claims



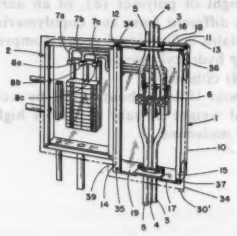
1. A connection between (a) a liquid cooled heavy current cable having an inner tube for the coolant, conductors thereon and an outer tube or hose; and (b) a socket member having a sleeve in which are inserted the conductors, and being provided for a connection to the inner tube, the connection between the cable and the socket member comprising an annular member for rotation on the sleeve of the socket member;
means for rotatably mounting the annular member on the sleeve for obtaining relative turning between the sleeve and the annular member; and
means for fastening the outer tube or hose to said annular member.

3,983,311

AUXILIARY GUTTER WITH LAY-IN END WALLS AND UNIVERSAL COVER

Walter T. Brumfield, Nicholasville; Robert C. Baker, and Theodore L. Brann, both of Lexington, all of Ky., assignors to Square D Company, Park Ridge, Ill.

Filed Dec. 18, 1974, Ser. No. 534,005
Int. Cl.² H02G 3/14
U.S. Cl. 174—50 5 Claims



1. An auxiliary gutter assembly securing and housing a section of a continuous length of electrical cable, said gutter being connected along one side to a load center, said gutter including a housing having an open front wall and oppositely spaced apart peripheral wall portions, lay-in channel means formed in said oppositely spaced apart peripheral wall portions including channel entrance means therein open to said front wall, a section of a continuous length of cable received within said housing, and universal cover means detachably secured to said housing to close said front wall, said universal cover means comprising a flat cover plate, a first straight longitudinal edge along one side thereof, a second straight longitudinal edge spaced apart from said first edge along the opposite side of said cover plate, said first and second longitudinal edges being parallel, a first side margin of said cover plate bordering said first longitudinal edge, a second side margin of said cover plate bordering said second longitudinal edge, said housing of said gutter including spaced apart parallel first and second longitudinal side walls, a first side wall flange extending laterally from the forward edge of said first longitudinal side wall, a second side wall flange extending laterally from the forward edge of said second longitudinal side wall, mounting aperture means positioned in said first and second side margins of said cover plate, said aperture means in said first side margin being located closer to its corresponding longitudinal side edge than said aperture means in said second side margin is to its corresponding longitudinal side edge, and correponding mounting bolt means positioned through said side wall flanges in attaching association with said mounting aperture means in said cover plate, said mounting bolt means through said first side wall flange being spaced farther from said first longitudinal side wall than said mounting bolt means through said second side wall flange are spaced from said second longitudinal side wall, the dimension across said front wall cover plate between said first and second longitudinal edges is sufficient in relation to the corresponding dimension across said housing for said second longitudinal edge of said cover plate to overhang said second longitudinal wall of said housing when said cover plate is mounted in position for a flush mounted installation, whereby said aperture means in said first side margin of said cover plate are in

registration with said mounting bolt means through said first side wall flange of said housing and the aperture means in said second side margin of said cover plate are in registration with said mounting bolt means through said second side wall flange, said first longitudinal edge of said cover plate lying inwardly from said first longitudinal side wall of said housing and said second longitudinal edge of said cover plate overhangs said second longitudinal wall of said housing when said aperture means in said cover plate and respective mounting bolt means through said flanges of said housing are in registration for a flush mounted installation, said cover plate including a break-away extension tab integrally formed to extend longitudinally a pre-determined length along said first longitudinal edge of said cover plate beginning from one end thereof, said extension tab extending laterally a pre-determined width from said first longitudinal edge of said cover plate, and a weakened region along a junction line between said extension tab and said cover plate to enable breaking said extension tab away from said cover plate along said junction line, said junction line being a continuation of said first longitudinal edge.

3,983,312

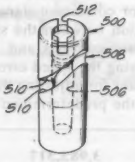
ELECTRICAL WIRE CONNECTOR

Harry A. Faulconer, 8323 Center Drive, La Mesa, Calif. 92041

Continuation-in-part of Ser. No. 74,907, Sept. 23, 1970, Pat. No. 3,668,301, which is a continuation-in-part of Ser. No. 316, Jan. 2, 1970, abandoned, which is a continuation-in-part of Ser. No. 676,002, Sept. 28, 1967, abandoned, which is a continuation-in-part of Ser. No. 594,785, Nov. 16, 1966, abandoned. This application Apr. 13, 1972, Ser. No. 243,600

Int. Cl.[2] H01R *5/10, 9/08*

U.S. Cl. 174—84 R **3 Claims**



3. In an electrical wire connector comprising an insulating body member having a passage extending at least partially through said body member, said passage having a longitudinal axis, a radial slot in said body member, said radial slot being defined by a pair of slot-defining surfaces, said slot communicating with said passage, and said slot dividing said passage into an upper section and a lower section, and a force transfer member stored in said upper section of said passage; the improvement comprising: said slot being disposed at an acute angle relative to said longitudinal axis of said passage, and said slot-defining surfaces being inclined toward said passage to facilitate inserting and maintaining a wire portion in said passage.

3,983,313

ELECTRIC CABLES

Robert Ney, Langerwehe, and Hans-Christoph Rhiem, Eschweiler, both of Germany, assignors to Lynenwerk KG, Eschweiler, Germany

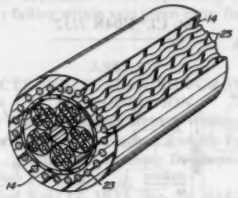
Division of Ser. No. 393,753, Sept. 4, 1973, Pat. No. 3,879,518. This application Feb. 4, 1975, Ser. No. 546,872

Claims priority, application United Kingdom, Sept. 5, 1972, 41209/72

Int. Cl.[2] H01B *7/18*

U.S. Cl. 174—121 SR **13 Claims**

1. An electric cable which includes: an electric cable core comprising at least one insulated electric conductor, a polyethylene cable sheath surrounding said cable core, and bundles of unimpregnated glass fibers free from a bonding agent embedded in said polyethylene cable sheath and relatively spaced concentrically about said cable core, each of said



bundles being enveloped by said sheath material sufficient to establish a mechanical bond between the enveloping polyethylene and said bundles of glass fibers, said bundles forming undulations in a direction longitudinally of said cable core.

3,983,314

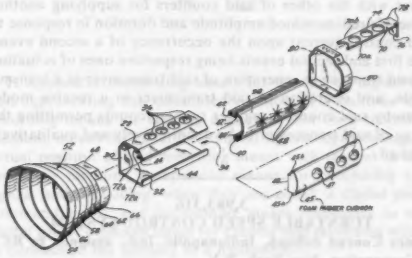
DEAD FRONT MULTI-TAP TERMINAL CONNECTOR CASING

Ilmar J. Filhaber, Poughkeepsie, N.Y., assignor to Fargo Mfg. Company, Inc., Poughkeepsie, N.Y.

Filed Aug. 1, 1975, Ser. No. 601,159

Int. Cl.[2] H01R *13/44*

U.S. Cl. 174—138 F **3 Claims**



1. A terminal connector casing including in combination an elongated body, an open side formed in said body through its length, a plurality of through holes provided in said body disposed in alignment longitudinally thereof, an elongated panel attached to said body in the zone of said open side to provide with said body a hollow tubular member, means attaching said panel to said body at the longitudinal edges thereof, a plurality of openings provided in said panel disposed in alignment longitudinally thereof with each opening in the respective transverse plane of one of said through holes, front and rear covers attached to said tubular member at either end thereof and a lid slidably attached thereto, said lid being constructed and arranged in one position thereof to simultaneously cover each of said through holes and a resilient nonconducting cushion within said casing with through openings formed in said cushion which are respectively aligned with said openings in said panel and said cushion being contoured to conform to the inner surface of said panel.

3,983,315

ELECTROMAGNETIC COUNTER CIRCUIT

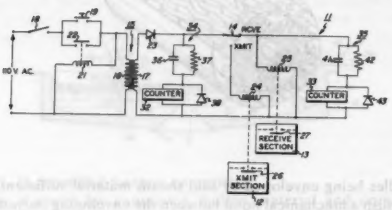
Yuji Watai, Tokyo, Japan, assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 5, 1975, Ser. No. 610,607

Claims priority, application Japan, Nov. 27, 1974, 49-142752

Int. Cl.[2] H04N 1/32

U.S. Cl. 178—6 6 Claims



1. A data collection device for automatically gathering quantitative and qualitative usage information from a facsimile transceiver; said transceiver including a first control circuit, a second control circuit, means for supplying a DC control current when said transceiver is activated, and a mode selector switch for selectively applying said control current to said first control circuit for conditioning said transceiver to operate in a transmit mode or to said second control circuit for conditioning said transceiver to operate in a receive mode; said data collecting device comprising a pair of counters, a first capacitive-type pulse generator connected in series with one of said counters for supplying a pulse of predetermined amplitude and duration in response to said control current to increment said counter upon the occurrence of a first event, and a second capacitive-type pulse generator connected in series with the other of said counters for supplying another pulse of predetermined amplitude and duration in response to said control current upon the occurrence of a second event; said first and second events being respective ones of actuation of said transceiver, operation of said transceiver in a transmit mode, and operation of said transceiver in a receive mode, whereby said counters register running counts permitting the usage of said transceiver to be quantitatively and qualitatively tracked.

3,983,316

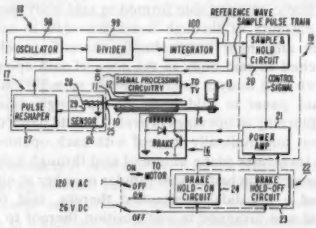
TURNTABLE SPEED CONTROL SYSTEM

James Conrad Schopp, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 17, 1975, Ser. No. 559,098

Int. Cl.[2] H04N 5/76; G11B 19/28

U.S. Cl. 178—6.6 P 9 Claims



1. In a system for playing back prerecorded information by a signal pickup from a disc record when relative motion is established therebetween; the playback system including a turntable for rotatably supporting the disc record; wherein for accurate reproduction of the prerecorded signals, a predetermined speed of rotation of the turntable is desired; the playback system including drive means for driving the turntable to rotate at a free running speed above the predetermined speed; adjusting means coupled to the drive means and responsive to a speed error correction signal for maintaining the speed of rotation of the turntable at the predetermined speed during playback; the system further including a signal processing circuit responsive to signals developed at the output of the signal pickup; the signal processing circuit including means for effecting frequency stabilization of components of the developed signals; a turntable speed control system comprising:

1. means responsive to the rotation of the turntable for generating a train of speed indicating pulses having a frequency which is a multiple, including one, of the actual speed of rotation of the turntable; the speed indicating pulses occurring at a predetermined frequency when the speed of rotation of the turntable is at the predetermined speed;
2. means for generating generally sawtooth-shaped reference waves having a frequency which is a greater-than-one multiple of the predetermined frequency of the speed indicating pulses; the reference wave generating means comprising an oscillator, a frequency divider responsive to the output of the oscillator, and an integrator circuit responsive to the output of the frequency divider for developing the sawtooth-shaped reference waves; the output of the oscillator being additionally supplied to the frequency stabilization effecting means;
3. means coupled to the speed indicating pulse generating means and the reference wave generating means, and responsive to the magnitude of the reference wave during the occurrence of each of the speed indicating pulses, for developing a speed error correction signal; the magnitude of the speed error correction signal being a function of the phase deviation between the speed indicating pulse train and the reference wave; and
4. means for supplying the speed error correction signal to the adjusting means for adjusting the speed of rotation of the turntable to the predetermined speed.

3,983,317

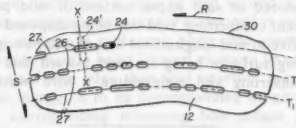
ASTIGMATIZER FOR LASER RECORDING AND REPRODUCING SYSTEM

Charles A. Glorioso, San Francisco, Calif., assignor to Teletype Corporation, Skokie, Ill.

Filed Dec. 9, 1974, Ser. No. 530,887

Int. Cl.[2] G11B 7/18; H04N 5/76

U.S. Cl. 178—6.6 R 13 Claims



1. In combination with a recording and reproducing system of the type having a recording surface being recorded thereon in a pattern of grooves arranged along a track, means for moving the track, a beam source, means for directing a source beam from the beam source continuously along the track on the surface, and means for detecting a reflected beam of energy from the surface to produce an output indicative of the groove pattern on the track, the improvement wherein:

the directing means includes an astigmatizer means, mounted to be removably positioned in the beam path between the beam source and the surface, for elongating the cross-section of the source beam on the surface so that its dimension in a direction transverse to the track is

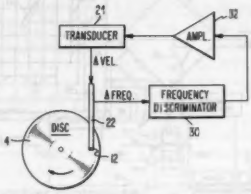
greater than its dimension in the direction of the track, only when said astigmatizer is positioned in the beam path.

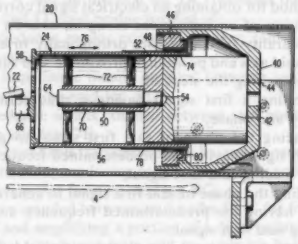
3,983,318

VELOCITY CORRECTION SYSTEM WITH DAMPING MEANS

Michael Evans Miller, and John Gordon Amery, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 351,598, April 16, 1973, abandoned. This application Sept. 2, 1975, Ser. No. 609,826
Int. Cl.² G11B 3/10, 25/04
U.S. Cl. 178—6.6 DD 15 Claims





1. In a velocity adjusting system for opposing undesired variations in the relative velocity between a moving record medium and a pickup means which is positioned adjacent to said record medium for detecting signals recorded on said record medium, said system including means for developing a correction signal in response to cyclical variations of said relative velocity falling in a given error frequency range, apparatus responsive to said correction signal to vary the physical position of said pickup means with respect to said record medium; said apparatus comprising:

transducer means having a stationary portion which includes means for generating magnetic flux and a movable portion which is subject to movement with respect to said stationary portion;

resilient means intercoupling said stationary portion and said movable portion, said resilient means being disposed so as to urge said movable portion to return to a null position with respect to said stationary portion when motion of said movable portion causes displacement from such null position;

mechanical means coupling said movable portion to said pickup means;

an electrical winding disposed on said movable portion in the path of said magnetic flux such that said correction signal passing through said winding imparts motion to said movable portion to vary the position of said pickup means in a manner that opposes said undesired variations in relative velocity; and

electrical damping means, mounted on said movable portion and disposed in the path of said flux throughout the range of motion of said movable portion for opposing any relative motion of said movable portion with repect to said stationary portion;

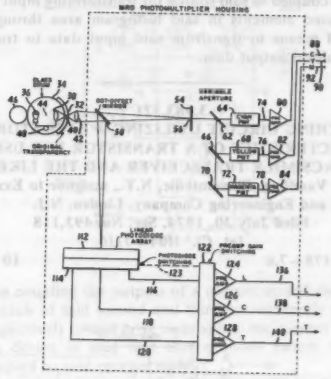
wherein the resilience of said resilient means is so related to the other mechanical characteristics of said transducer apparatus as to establish a natural resonance for said transducer apparatus under operating conditions at a frequency falling within said given error frequency range.

3,983,319

ELECTRONIC SCREENING FOR IMAGE REPRODUCTION

William West Moe, Stratford; Robert William Lotz, Darien; Ethan Robert Green, Monroe, and Rodolfo Fazio, Southport, all of Conn., assignors to Printing Developments, Inc., New York, N.Y.

Filed Nov. 12, 1973, Ser. No. 414,798
Int. Cl.² H04N 5/84
U.S. Cl. 178—6.7 R 9 Claims



1. Apparatus comprising means for generating digital signals representing the calculated position of a halftone dot, recording means for forming a halftone dot on a recording medium, means for generating digital signals representing the actual position of said recording means with respect to said recording medium, comparator means for comparing said signals and producing, when they are equal, a digital print-command signal, and dot-forming means responsive to said digital print-command signal for causing said recording means to commence the forming of a halftone dot.

3,983,320

RASTER DISPLAY HISTOGRAM EQUALIZATION

David J. Ketcham; Roger W. Lowe, both of Lakewood; Michael D. Pruznick, Huntington Beach, and Eugene W. Opittek, Santa Ana, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 25, 1975, Ser. No. 608,319
Int. Cl.² H04N 3/00
U.S. Cl. 178—6.8 10 Claims

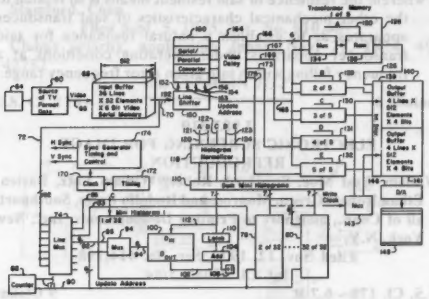
1. A histogram equalization system for converting data from a source of a first number of bits to a second number of bits for forming a display raster including a selected number of vertical elements by a selected number of horizontal elements comprising:

first means coupled to said source of data for forming sub histograms of a selected portion of a histogram area,

second means coupled to said first means for forming a histogram of a selected area of said raster,

transform means coupled to second means for forming transformed data representing truncation points.

third means coupled to said transform means for storing said transform data, and



means coupled to said source for transforming input data of selected elements in said histogram area through said third means to transfrom said input data to truncated equalized output data.

3,983,321

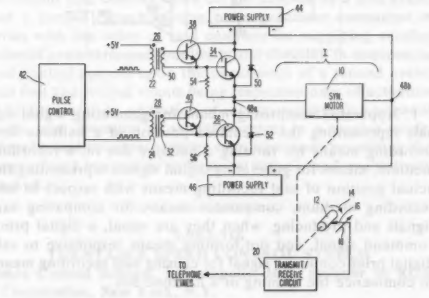
SWITCHING CIRCUIT UTILIZING A BASE STORAGE CHARACTERISTICS OF A TRANSISTOR FOR USE IN A FACSIMILE TRANSCEIVER AND THE LIKE

John M. Vandling, Pleasantville, N.Y., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed July 30, 1974, Ser. No. 493,118

Int. Cl.² H04N 1/36

U.S. Cl. 178—7.6 **10 Claims**



5. A facsimile unit comprising scanning means, a scanning motor for driving said scanning means and a scanning transducer means comprising:

a source of low voltage, substantially constant frequency pulses separated by a substantially constant time interval;

high voltage isolation means having an input and an output;

pulse control means coupled to said source and said input of said high voltage isolation means for controlling the application of pulses to said input; and

a switching transistor having a base, an emitter and a collector, said transistor being characterized by a base storage time exceeding said time interval between said low voltage pulses, said base being coupled to said output of said isolation means so as to render said transistor conductive between said emitter and said collector during said pulses and during said intervals between said pulses and

a power supply coupled to said transistor and said motor so as to apply power to said motor during the application of pulses to the base of the transistor.

3,983,322

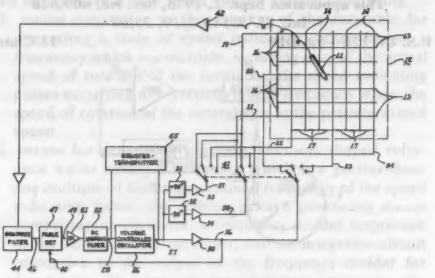
METHOD AND APPARATUS FOR CONVERTING THE LOCATION AND MOVEMENT OF A MANUALLY CONTROLLED INSTRUMENT INTO CORRESPONDING ELECTRICAL SIGNALS

James L. Rodgers, Tempe, Ariz., assignor to Talos Systems, Inc., Scottsdale, Ariz.

Filed July 31, 1975, Ser. No. 600,820

Int. Cl.² G08C 21/00

U.S. Cl. 178—19 **10 Claims**



1. A method for obtaining an electrical signal corresponding to the position of an instrument along an axis on a surface having a plurality of conductors orthogonally oriented with respect to said axis and positioned proximate said surface, said method comprising the steps of:

a. generating a first signal having a predetermined frequency and phase;

b. advancing the phase of said first signal to generate a second signal having the predetermined frequency and a phase leading said first signal;

c. retarding the phase of said first signal to generate a third signal having the predetermined frequency and a phase lagging said first signal;

d. generating a time varying electrostatic field across said surface by applying said first signal to a first of said conductors, applying said second signal to a second of said conductors, and applying said third signal to a third of said conductors;

e. sensing the phase and frequency of the time varying electrostatic field at the position of the instrument and generating a control signal in response thereto having said predetermined frequency and a phase unique to said position;

f. comparing said control signal to said first signal;

g. changing the predetermined frequency until a first stable condition is reached in which said control signal compares to said first signal in accordance with a predetermined relationship;

h. producing a first output signal representative of said first stable condition;

i. reversing said second signal and said third signal to apply said second signal to said third conductor and said third signal to said second conductor, thereby changing the electrostatic field at the position of the instrument;

j. sensing the changed electrostatic field and changing said control signal in response thereto;

k. changing the predetermined frequency until a second stable condition is reached in which said changed control signal compares to said first signal in accordance with said predetermined relationship;

l. producing a second output signal representative of said second stable condition; and

m. combining said first output with said second output signal to obtain a differential output signal uniquely corresponding to the position of the instrument on said axis.

3,983,323

FULL-DUPLEX DIGITAL TRANSMISSION LINE SYSTEM

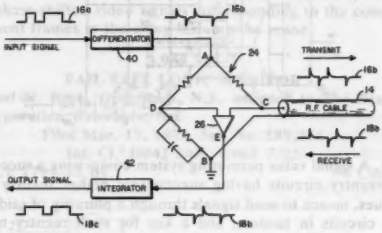
Ernest S. Griffith, St. Louis Park, and William W. Davis, Minneapolis, both of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Sept. 24, 1973, Ser. No. 399,908

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² H04L *5/14*; H04B *3/50*

U.S. Cl. 178—58 R 6 Claims



1. A transceiver comprising:

input means for receiving a binary-level, digital input signal;

a Wheatstone bridge having four external legs AD, DB, BC, CA and an internal leg DC between the nodes A, B, C and D, said bridge formed of:

first impedance means coupled between said nodes C, A for forming said leg CA;

second impedance means coupled between said nodes A, D for forming said leg AD;

third impedance means coupled between said nodes D, B for forming said leg DB;

a single coaxial cable transmission line having its center conductor and its outer conductor coupled directly to nodes C and B, respectively, for forming said leg BC;

an amplifier coupled between said nodes D, C for forming said leg DC and amplifying a portion of a differentiated received signal that is received from said transmission line;

a capacitor coupled to said input means for differentiating said input signal and coupling a differentiated input signal to said node A of said Wheatstone bridge, a portion of which appears across said leg BC as a differentiated input signal to be transmitted by said transmission line;

bistable means coupled to the output of said amplifier for converting the output of said amplifier to a binary-level digital output signal.

3,983,324

FULL DUPLEX DRIVER/RECEIVER

William Arthur Lacher, Lansdale, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 31, 1975, Ser. No. 563,610

Int. Cl.² H04L *5/14*

U.S. Cl. 178—59 10 Claims

1. A full duplex driver/receiver module comprising:

a driver and a receiver portion;

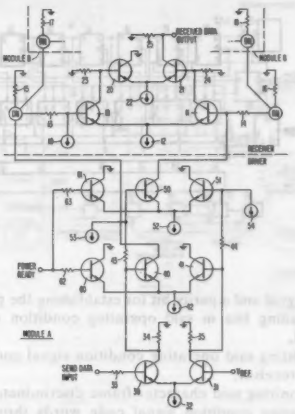
said receiver portion comprising a plurality of semiconductor current amplifying devices including a first differentially configured current-mode switch;

said driver portion comprising a plurality of semiconductor current amplifying devices including second and third differentially configured current-mode switches;

a drive node and a receive node within said module, the data being sent by said module and being received thereby appearing respectively on said drive and receive nodes, means coupling said drive and receive nodes respectively to the current amplifying devices of said first current-mode switch;

an input stage comprising a pair of current amplifying devices configured as a fourth differential current-mode switch, the data being sent by said module being applied to one of said last mentioned current amplifying devices, the other of said current amplifying devices being coupled to a reference potential;

each of said pair of current amplifying devices of said fourth current-mode switch being coupled to a current amplifying device in each of said second and third current-mode switches, the state of conduction of each of said last-mentioned devices being a function of the respective conductive states of the devices in said fourth current-mode switch, which states are in turn dependent upon said data being sent by said module;



means coupling the outputs of a current amplifying device in each of said second and third current-mode switches respectively to said drive node and to the current amplifying device in said first current-mode switch which is coupled to said receive node;

the state of conduction of the current amplifying devices in said first current-mode switch being a function of the data on said receive node, and being unaffected by the data being sent by said module and appearing on said drive node.

3,983,325

METHOD OF ESTABLISHING SYNCHRONISM BETWEEN TELETYPEWRITER TRANSMITTER AND TELETYPEWRITER RECEIVER

Max Öllinger, and Wernhard Markwitz, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 31, 1973, Ser. No. 411,368

Claims priority, application Germany, Dec. 4, 1972, 2259335

Int. Cl.² H04L *7/04*; H04B *3/10*

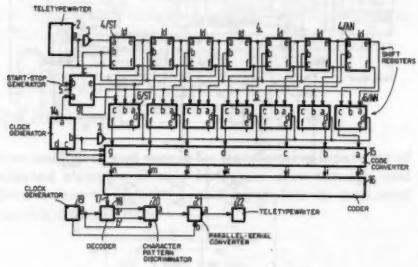
U.S. Cl. 178—69.5 R 3 Claims

1. In a data transmission system wherein unidirectional teletypewriter transmissions occur between a transmitter and receiver, wherein character signals including a start signal, information signals and stop signals are produced in binary code form for transmission, wherein operating conditions signals including a continuous start signal and a continuous stop signal are produced for transmission and wherein a character frame discriminator produces a clock signal for ensuring character frame synchronism between said transmitter and receiver, a method for establishing character frame synchronism during transmission of telegraph signals comprising the steps of:

encoding, firstly, said character signals in said transmitter for producing character code words therefrom said character code words each comprising an initial bit corresponding to said start signal, all of said character code words having initial bits of like polarity, a plurality of bits

corresponding to said information signals and a parity bit for establishing the parity of the other bits in said character code word,

encoding, secondly, in said transmitter said operating condition signals producing therefrom operating condition signal code words which indicate a character frame, said operating condition code words each comprising a first bit which is inverted relative to said initial bit of said character code words, a number of other bits equalling the number of information signal elements in said character signal and a parity bit for establishing the parity of the preceding bits in said operating condition signal code word,



transmitting said operating condition signal code words to said receiver,

synchronizing said character frame discriminator with said operating condition signal code words throughout the duration of the character signals and

decoding said operating condition signal code words in said receiver.

3,983,326

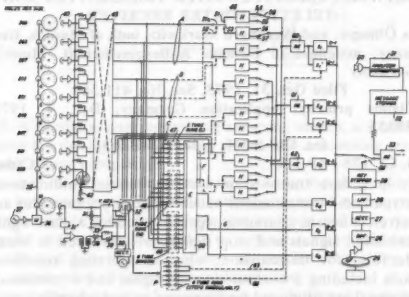
KEY PULSE GENERATOR FOR SECRECY SIGNALLING CIRCUIT

Danforth K. Gannett, Mountain Lakes, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 27, 1944, Ser. No. 555,913

Int. Cl.² H04L *9/04*

U.S. Cl. 179—1.5 R **18 Claims**



6. In a pulse generating system, means for producing irregular pulses in each of a number of separate circuits, an output for each of said circuits, a pair of holding devices for each of said circuits, means for connecting said holding devices one at a time to their respective circuits and means for combining pulses impressed on each of said outputs from said several circuits with other pulses from a corresponding one of said holding devices.

3,983,327

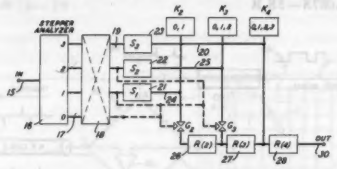
ELECTRICAL SIGNALING

Danforth K. Gannett, Mountain Lakes, and Andrew C. Norwine, Short Hills, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 9, 1945, Ser. No. 603,936

Int. Cl.² H04L *9/02*

U.S. Cl. 179—1.5 R **12 Claims**



1. A signal value permuting system comprising a succession of reentry circuits having successively higher reentry point values, means to send signals through a plurality of said reentry circuits in tandem, and a key for each reentry circuit, means to add key and signal values together at the input side of each reentry circuit, each key having a range of values the maximum value of which is lower than the reentry point value of the reentry circuit with which the respective key is associated.

3,983,328

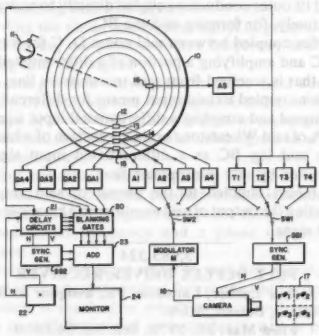
TELEVISION SYSTEM FOR THE DISPLAY OF VISUALS WITH HIGH RESOLUTION

George F. Newell, Sutton, England, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 7, 1975, Ser. No. 556,373

Int. Cl.² H04M *5/78*

U.S. Cl. 178—6.8 **15 Claims**



1. In a television system of the type wherein a portion of a transmitted scene is displayed by a television receiving tube with high resolution as compared with the display resolution of the entire scene by the same television receiving tube, the combination comprising:

means for producing separate video signals corresponding to separate frames forming an array of component frames of a scene,

a storage medium including independent recording means to separately record the video signal corresponding to each frame in the array of frames forming the scene,

timing control means to synchronize the video signals in phase-shifted relations for separate recording by said storage medium such that a video signal corresponding to one component frame of the scene is recorded at a predetermined time-displaced relation to the recording of the video signal corresponding to a different component

frame that is contiguous therewith in the scene, said timing control means including time delay means for each one of at least some of the separate video signals,

means coupled to each time delay means for producing a sync phase control signal,

sync generator means for applying horizontal and vertical scan control pulses to said means for producing separate video signals, and

control means for coupling each sync phase control signal to said sync generator means to phase shift the horizontal and vertical scan control pulses and thereby provide phase-shifted video signals corresponding to the component frames in the array forming the scene.

3,983,329

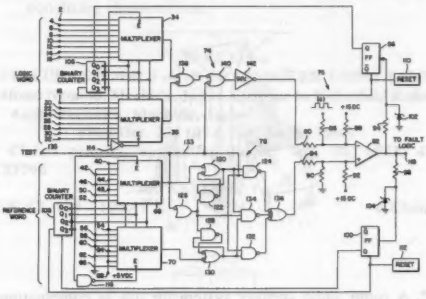
FAIL SAFE LOGIC MONITOR

Michael H. Rock, Glen Rock, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Mar. 17, 1975, Ser. No. 559,346

Int. Cl.² H04J *3/00*; G06F *7/02*

U.S. Cl. 179—15 BF **6 Claims**



1. A fail safe system for monitoring a multi-bit logic word, comprising:

first multiplexing means for multiplexing the multi-bit logic word;

second multiplexing means for multiplexing a multi-bit reference word;

first gating means connected to the first multiplexing means for gating the output therefrom;

second gating means connected to the second multiplexing means for gating the output therefrom;

comparator means connected to the first and second gating means and responsive to the gated outputs therefrom for providing an alternating output when the gated outputs are in substantial agreement, and otherwise providing a constant level output;

first means connected to the comparator and to the first multiplexing means and responsive to the alternating comparator output for providing an address for the first multiplexing means;

second means connected to the comparator and to the second multiplexing means and responsive to the alternating comparator output for providing an address for the second multiplexing means;

each of the first and second means including means connected to the comparator for dividing the frequency of the alternating output therefrom, counting means connected to the frequency dividing means and to a corresponding multiplexing means, and responsive to the divided comparator outpout for providing the address for said multiplexing means; and

the counting means in each of the first and second means being normally synchronized, with an internal system failure rendering the counters desynchronized, whereupon the gated outputs are otherwise than in substantial agreement and the comparator means provides the constant level output.

3,983,330

TDM SWITCHING NETWORK FOR CODED MESSAGES

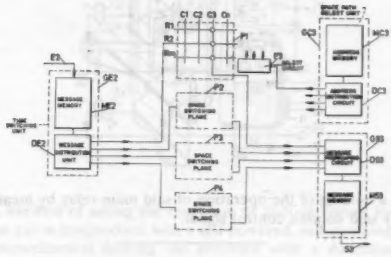
Erich Tongi, Viroflay, France, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 11, 1975, Ser. No. 567,120

Claims priority, application France, Apr. 18, 1974, 74.13453

Int. Cl.² H04J *3/00*

U.S. Cl. 179—15 AT **7 Claims**



7. A switching network for coded messages transmitted by time-division multiplexing over multiplex lines each having several time channels, including a set of identical space-division switching planes comprised of crosspoints at the intersections of input lines and output lines, and means for controlling the said crosspoints, wherein said set of space-division switching planes is divided into groups of planes, with each group completely independent from each other group, and each group being capable of transmitting different messages, each of the planes of one group transmitting in serial form only one message of a communication while the other messages of said communication are transmitted respectively by the other planes of the said group, said network further including means for storing messages at the input of said network, means for distributing messages for serial transmission through said planes, and means for regrouping messages at the output of said network.

3,983,331

SWITCH HAVING A MATRIX OF RELAYS

Christian Vie, St.-Cyr-l'Ecole, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

Filed Sept. 20, 1974, Ser. No. 507,958

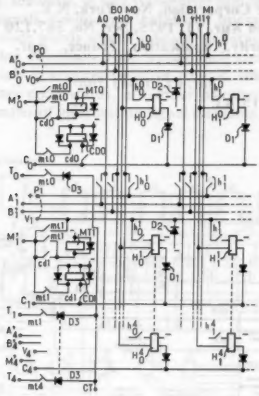
Claims priority, application France, Sept. 20, 1973, 73.33808

Int. Cl.² H04Q *3/42*

U.S. Cl. 179—18 GE **17 Claims**

1. A switch for use in telecommunications comprising a matrix of main relays including rows and columns of said main relays, each of said main relays controlling a multi-channel connection at a junction of said rows and said columns of said matrix, and each of said main relays being controlled by a row control signal applied to respective rows of said main relays of said matrix and by a column control signal applied to respective columns of said main relays of said matrix; and control means for controlling said main relays, said control means including two auxiliary relays for each column, a first of said two auxiliary relays effecting operation of a main relay being

controlled by both said row control signal and said column control signal, and a second of said two auxiliary relays effecting a holding of the operation of said main relay by means of only said column control signal.



3,983,332

CONFERENCE CALL CIRCUITRY FOR TDM SIGNAL EXCHANGE

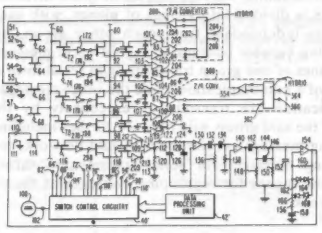
Michael Allen Patten, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 3, 1974, Ser. No. 475,681

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

Int. Cl.² H04M *3/56*

U.S. Cl. 179—1 CN **13 Claims**



1. Conference call circuitry for conferencing more than two subscribers sets connected in a time division electric signal exchange switching circuit arrangement of the type having

a multiple of pairs of exchange input terminals at which the output signals of subscriber sets are applied,

one pair of said pairs of input terminals being reserved for said conference call circuitry,

a multiple of pairs of exchange output terminals at which the output signals for said subscriber sets appear in reconstructed form,

one pair of said pairs of output terminals being reserved for said conference call circuitry, and

circuitry connected in said switching circuit arrangement for successively sampling the signals appearing at all of said pairs of input terminals and multiplexing the sampling to all of said pairs of output terminals at a predetermined rate at which at least all of the applied signals are translated individually to said pairs of output signal terminals,

the improvement comprising said conference call circuitry including

other input terminals connected to said one reserved pair of exchange output terminals of said switching circuit arrangement,

other output terminals connected to said one reserved pair of exchange input terminals, and

signal reconstructing circuitry comprising active and reactive signal modifying components connected between said other input terminals and said other output terminals for compensating for signal regeneration due to conferencing.

3,983,333

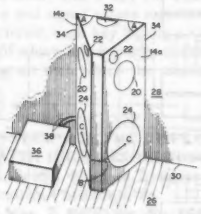
LOUD SPEAKER SYSTEM

Roy F. Allison, Wayland, Mass., assignor to Allison Acoustics Inc., Natick, Mass.

Continuation-in-part of Ser. No. 447,065, March 1, 1974, abandoned. This application Apr. 7, 1975, Ser. No. 565,875

Int. Cl.² H04R *1/28*

U.S. Cl. 179—1 E **14 Claims**



7. A room audio speaker system for use in combination with at least one room boundary surface comprising:

an enclosure having

a closed end wall free from any audio reproducer means and adapted for placement closely adjacent said room boundary surface,

a pair of side walls, each of said pair extending away from said end wall at an angle with respect to said end wall of no more than 90° and providing a front edge, side edges, and a rear edge,

said rear edge of each of said pair forming a boundary with said end wall, and

said front edges of said pair being closely adjacent and connected to each other whereby said end wall and said side walls define a triangle in cross-section; and,

direct radiator audio reproducer means mounted on each of said pair of walls midway between said front edge and said rear edge of said each of said pair of walls for projecting sound outwardly therefrom.

3,983,334

MATRIX AND EQUALIZER CIRCUIT WITH GAIN CONTROL

Nobuaki Takahashi, Yamato; Yasuo Itoh, Tokyo, and Masao Kasuga, Sagamihara, all of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Feb. 21, 1975, Ser. No. 551,733

Claims priority, application Japan, Feb. 26, 1974, 49-21888

Int. Cl.² G11B *3/74, 3/00*

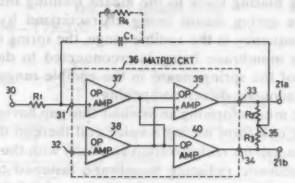
U.S. Cl. 179—100.4 ST **4 Claims**

1. A matrix and equalizer circuit comprising:

matrix operational circuit means having two input terminals to which are applied, respectively, sum and difference signals derived from first and second channel signals, and two output terminals through which said first and second channel signals are respectively transmitted, means in

said matrix for giving gains to said sum and difference signals applied to said input terminals;

a pair of resistance elements having equal resistance value connected in series and between said output terminals of said matrix operational circuit means; and



a feedback loop connected from a junction of the pair of resistance elements through a capacitor to the input terminal of said sum signal of the matrix operational circuit means,

said feedback loop causing said sum signal to have a specific equalizing characteristic.

3,983,335

STYLUS ASSEMBLY AND TRANSDUCER USING SAME

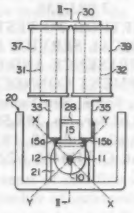
Mitsuo Nemoto, Machida, Japan, assignor to Kabushiki Kaisha Audio-Technica, Machida, Japan

Filed Oct. 23, 1974, Ser. No. 517,044

Claims priority, application Japan, Nov. 27, 1973, 48-133790

Int. Cl.² H04R 11/12

U.S. Cl. 179—100.41 K **6 Claims**



1. A stylus assembly for a stereophonic cartridge comprising an elongate axially extending cantilever arm having a stylus tip at its forward end adapted to track a sound groove having modulated walls, a carrier fixed to said cantilever arm at the rear end thereof, said carrier consisting of a material having a rigidity reduced as compared to that of the centilever arm, a single horizontally disposed armature secured to said carrier at an elevation above the point at which the carrier is fixing to said cantilever arm in an orientation transverse to that of said axially extending cantilever arm, and support means for supporting said cantilever arm, said carrier and armature for vibratory movement and comprising a mounting member fixed in rearwardly spaced relation to said carrier and including a fulcrum wire disposed axially of said cantilever arm and connected between said mounting member and said carrier, said fulcrum wire having a point thereon defining a fulcrum about which said support means is adapted to vibrate, said cantilever arm lying in a first imaginary vertical plane which passes through said armature substantially midway between its opposite ends and said armature lying in a second imaginary vertical plane transverse to the first vertical plane, which second vertical plane passes through said fulcrum, said armature additionally lying in an imaginary horizontal plane which is parallel to the imaginary underlying horizontal plane in which the cantilever arm lies, imaginary lines joining the respective ends of the armature and said fulcrum being projections of said modulated walls of said sound groove which said stylus is adapted to track.

3,983,336

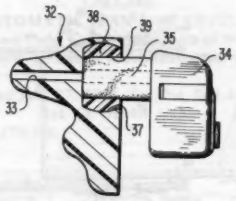
DIRECTIONAL SELF CONTAINING EAR MOUNTED HEARING AID

Hooshang Malek, 3028 Essex Road, Baltimore, Md. 21207, and Alvin F. Polan, 444 E. Belvedere Ave., Baltimore, Md. 21212

Filed Oct. 15, 1974, Ser. No. 514,931

Int. Cl.² H04R 1/32, 25/00, 25/02

U.S. Cl. 179—107 FD **13 Claims**



12. Method of aiding the reception of audible signals by a human ear in conjunction with a self-powered, self-contained, electromechanical hearing aid provided with a directional microphone to detect audible signals, amplifier means and a receiver to transmit amplified audible signals into the inner ear canal, comprising the steps of:

a. attaching the directional microphone to an ear to support the microphone exteriorly of the ear canal for unrestricted adjustment of the direction of the microphone in a plane generally normal to the entrance to the ear canal, and;

b. adjusting the direction of said microphone in said plane by the wearer of the hearing aid while the hearing aid is so attached to select a position of the microphone which produces optimum reception of audible signals.

3,983,337

BROAD-BAND ACOUSTIC SPEAKER

Burton A. Babb, Dallas, Tex., assignor to Babbco, Ltd., Dallas, Tex.

Filed June 21, 1973, Ser. No. 372,074

Int. Cl.² H04R 7/14, 7/18, 9/02, 9/04

U.S. Cl. 179—115.5 R **39 Claims**

1. In an acoustic transducer, the combination of:

a magnetic assembly having an annular flux gap formed between a cylindrical center pole of uniform diameter and an outer pole disposed around the center pole;

a coil assembly including a tubular coil form means reciprocally disposed in the flux gap, the interior of the coil form means having a plurality of circumferentially spaced, Teflon bearing surfaces in continuous sliding contact with the uniform diameter of the cylindrical center pole to guide the coil form means relative to the magnetic assembly;

means forming an acoustic radiating surface attached to the coil assembly and reciprocated by the coil assembly when an electrical signal is passed through the coil; and

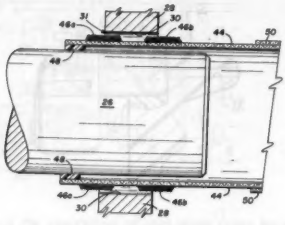
means for providing a peripheral air seal between the radiating surface and a stationary baffle.

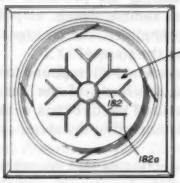
2. In an acoustic transducer, the combination of:

a magnetic assembly having an annular flux gap formed between a cylindrical center pole having a free end and an outer pole disposed around the center pole, the cylindrical center pole having a constant diameter for at least the length of the flux gap and no greater diameter than the constant diameter between the flux gap and the free end of the center pole, the constant diameter forming a

continuously cylindrical bearing surface extending into the flux gap;

a coil assembly including a voice coil wound on a tubular coil form and reciprocally disposed in the flux gap, the coil form having an internal Teflon bearing surface in continuous sliding contact with the cylindrical bearing surface including a portion of the bearing surface within the flux gap to guide the coil form means relative to the magnetic assembly, the Teflon bearing surface being formed by a substantially continuous ring of Teflon and the bearing surface having an axial length substantially shorter than the coil form means and being disposed near the end of the coil form remote from the means forming the radiating surface;





means forming an acoustic radiating surface attached to the end of the coil assembly beyond the free end of the center pole and reciprocated by the coil assembly when an electrical signal is passed through the coil; and

means for providing a peripheral air seal between the radiating surface and a stationary baffle and radial support for the radiating surface.

4. In an acoustic transducer, the combination of:

a magnetic assembly having an annular flux gap formed between a cylindrical center pole and an outer pole disposed around the center pole;

a coil assembly including a tubular coil form means reciprocably disposed in the flux gap, said coil form means being in continuous sliding contact with the magnetic assembly to guide the coil form means relative to the magnetic assembly;

means forming an acoustic radiating surface attached to the coil assembly and reciprocated by the coil assembly when an electrical signal is passed through the coil; and

means for providing a peripheral air seal between the radiating surface and a stationary baffle and radial support for the radiating surface, said means also axially biasing the radiating surface to a predetermined axial position and providing essentially the only axial bias to the radiating surface and the coil assembly, and including a plurality of spring metal members cantilevered from the peripheral support flange and extend toward the peripheral edge of the means forming the acoustic radiating surface.

6. The transducer comprising a magnetic assembly forming a flux gap, a coil assembly having a coil reciprocally disposed in the flux gap, means forming an acoustic radiating surface attached to the coil assembly and having a peripheral edge, means forming an annular opening around the peripheral edge, a flexible membrane sealing the annular opening while permitting reciprocation of the means forming the radiating surface, and a plurality of circumferentially spaced spring means disposed between the means forming the radiating surface and the means forming the annular opening for applying a spring biasing force to the means forming the radiating surface, the spring means being characterized by having a resonant frequency in the audible range, the spring means and the flexible membrane being interconnected to dampen the resonance of the spring means in the audible range.

10. The acoustic driver comprising:

magnetic means forming an annular flux gap having an axis;

a tubular coil form having a voice coil thereon disposed in the flux gap for reciprocation coaxially with the flux gap;

a thin, acoustic radiating membrane fastened to the coil form having an axis coaxial with the axis of the flux gap and coil form; and

a plurality of rib members coupled to the coil form by means for transmitting acoustic energy at frequencies above about 8,000 Hz and radiating outwardly from the coil form, each rib member being coupled along its length to the membrane by means for transmitting acoustic energy at frequencies above about 8,000 Hz to the adjacent portion of the membrane, each rib being fabricated from a material of high rigidity and having its major cross sectional dimension-disposed substantially at a right angle to the membrane surface, each rib having, when coupled to the membrane, a longitudinal transmission velocity at least near the coil form for acoustic vibrations parallel to the axis of reciprocation between 8,000 Hz and 16,000 Hz that is equal the velocity of acoustic energy in standard air.

3,983,338

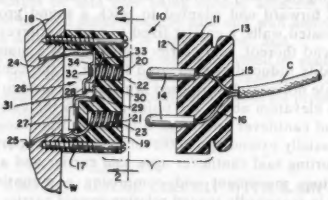
APPARATUS AND METHOD TO TEST THE CONDITION OF AN ELECTRICAL SERVICE LINE AND TO DETERMINE THE PRESENCE AND/OR REMOVAL OF ELECTRICAL EQUIPMENT CONNECTED TO THE LINE

William R. Mathauser, Box 5, Sun Valley, Idaho 83353

Continuation-in-part of Ser. No. 398,593, Sept. 19, 1973, abandoned. This application July 30, 1975, Ser. No. 600,512

Int. Cl.[2] H04M *3/22*

U.S. Cl. 179—175.2 C **14 Claims**

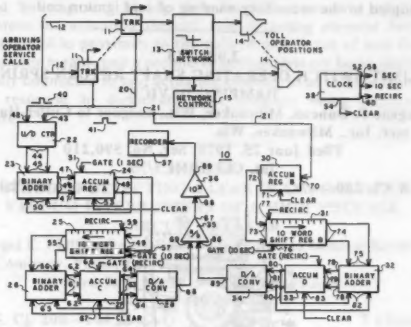


13. A coupling device for selectively connecting and disconnecting electrical equipment to a service line, including impedance means and switch means connected in series across the service line in the coupling device, said switch means operable in response to connection of electrical equipment thereto to remove the impedance from the line and thus modify a signal transmitted to the coupling device through the line to indicate the presence of the electrical equipment connected to the line.

3,983,339
DYNAMIC SPEED OF ANSWER RECORDER

William R. Wedmore, Glen Ellyn, and Dennis H. Verbeek, Lisle, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Nov. 28, 1975, Ser. No. 636,385
Int. Cl.² H04M 3/36
U.S. Cl. 179—175.2 C 13 Claims



1. In a toll telephone operating system of the type including a plurality of access trunks adapted to be conditioned by subscribers for initiating calls for service, a plurality of operator positions for servicing the subscriber calls for service, a switch network for connecting the calls for service to the available operator positions, and a network control for controlling the connections established by the switch network, a monitoring system for monitoring the average wait time for service comprising:

first means coupled to each of the access trunks for providing a pulse responsive to each call for service;

second means coupled to the network control for providing a pulse responsive to each connection of a call for service at the trunks to an operator position;

first counting means coupled to said first and second means and responsive to said first and second means pulses whereby the contents of said first counting means represents the total number of outstanding calls for service;

first adding means coupled to said first counting means for adding the contents of said first counting means at periodic intervals during predetermined time periods of a fixed duration to thereby provide a first added count at the end of each of said predetermined time periods;

first storing means coupled to said first adding means for storing a given number of the last said first added counts provided by said first adding means;

second adding means coupled to said first storing means for adding said given number of said first added counts stored in said first storing means at the end of each of said predetermined time periods to thereby provide a first total count at the end of each of said predetermined time periods;

second counting means coupled to the network control and responsive to said second means pulses for accumulating said second means pulses during each said predetermined time period whereby the contents of said second counting means represents a second added count which is the total number of calls for service at the trunks which have been connected to an operator position during each respective predetermined time period;

second storing means coupled to said second counting means for storing said given number of the last said second added counts provided by said second counting means;

third adding means coupled to said second storing means for adding said given number of said second added counts stored in said second storing means at the end of said predetermined time periods to thereby provide a second total count at the end of each of said predetermined time periods;

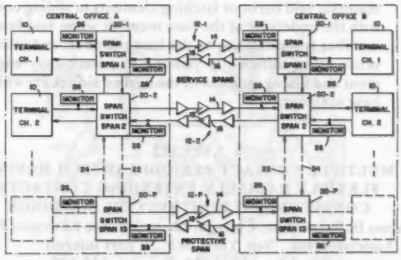
dividing means coupled to said first adding means and to said third adding means for dividing said first total count by said second total count at the end of said predetermined time periods to thereby provide a quotient at the end of said predetermined time periods which represents the average wait time for service; and

display means coupled to said dividing means for periodically displaying said quotient.

3,983,340
AUTOMATIC SPAN LINE SWITCH

Paul J. Lima, and Todd V. Townsend, both of Washoe County, Nev., assignors to Lynch Communication Systems, Inc., Reno, Nev.

Filed Jan. 27, 1975, Ser. No. 544,483
Int. Cl.² H04B 3/46
U.S. Cl. 179—175.3 S 9 Claims



8. The method of automatically transferring a service span channel to a protective span upon occurrence of a service span failure comprising the steps of:

a. detecting a failure on said service span;

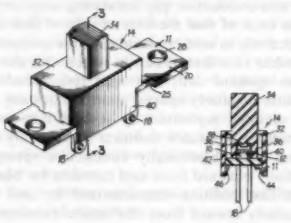
b. transmitting, in response to said failure detection, coded switching information in the form of valid code words over said service span; and

c. using said coded switching information to effect the transfer of said channel.

3,983,341
SIMPLIFIED SLIDE SWITCH

Ronald J. Stanish, Hollywood, Fla., assignor to AMF Incorporated, White Plains, N.Y.

Filed June 3, 1975, Ser. No. 583,466
Int. Cl.² H01H 15/00, 9/02
U.S. Cl. 200—16 D 8 Claims



1. A slide switch comprising

a thin insulator base member having two end portions and an intermediate portion therebetween,

a plurality of stationary contacts extending from one surface of the base member in said intermediate portion,

a plurality of terminal means for said stationary contacts extending from the opposite surface of said base member,

a slidable housing member formed as a unitary plastic piece having an upper portion extending transversely of said intermediate portion of the base member and including yieldable side skirts extending downwardly over the sides of said intermediate portion of the base member,

one or more barb or latch elements at the lower portion of each side skirt and extending inwardly for slidingly engaging the under side of the intermediate portion of said base member,

a movable contact member disposed between the housing member and said stationary contacts and operable in response to the sliding motion of the housing member for selectively making and breaking contact with one or more of said stationary contacts,

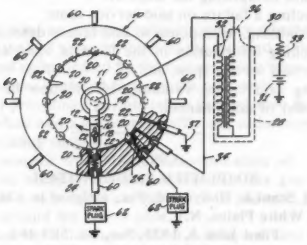
stop means on said base member for limiting sliding movement of said housing member to the intermediate portion of said base member,

said yieldable side skirts being spaced apart relative to the width of said intermediate portion of the base member to maintain said barbs or latching elements in sliding contact with the underside of the base member when said housing member is slid relative to the base member, and said side skirts being sufficiently yielding to permit easy engagement and disengagement of the barbed side skirts with the base member.

3,983,342
MULTIPLE CONTACT PERIODIC SWITCH HAVING FLEXIBLE RADIALLY EXTENDING CONTACTS CONNECTED TO IGNITION COIL WINDINGS

James D. Scapardine, Chicago, Ill., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Jan. 30, 1975, Ser. No. 545,577
Int. Cl.[2] H01H *19/00*; **F02P** *7/00*
U.S. Cl. 200—26 **1 Claim**

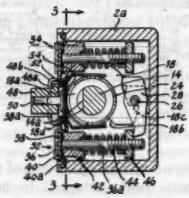


1. A distributor device for an internal combustion engine which comprises: an electrically conductive split ring member having a first non-conductive gap separating angularly spaced apart opposite ends of said member; a pair of first terminals coupled respectively to said opposite ends for connecting said split ring member in a first circuit in series with the primary winding of an ignition coil; said split ring member being formed by plural angularly spaced apart electrically conductive arcuate sections separated by second non-conductive gaps, plural radially moveable contacts respectively disposed in said second gaps, electrically conductive spring means extending radially outward from said contacts for biasing said contacts to a first position characterized by said contacts protruding radially inward from the inside diameter of said split ring member with said contacts respectively electrically bridging between adjacent ring sections on opposite sides of each contact for completing said first circuit; plural second terminals respectively electrically coupled to said spring means for feeding a plurality of spark plugs; a rotor carried within said split ring member for rotation about the axis of said member; said rotor including a radially elongated electrically conductive arm of a length for sequentially engaging said contacts in response to rotation of said rotor; said arm being of a length for driving an engaged one of said contacts radially outward and away from said adjacent ring sections on either side of said contact for opening said first circuit; and conductive wiper means for constantly engaging said arm, despite the rotation of said rotor, for enabling said arm to be electrically coupled to the secondary winding of said igniton coil.

3,983,343
LIMIT SWITCH OPERATING SHAFT RETURN SPRING DAMPING DEVICE

Eugene F. Duncan, Milwaukee, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed June 25, 1975, Ser. No. 590,210
Int. Cl.[2] H01H *3/16*
U.S. Cl. 200—47 **5 Claims**



1. In a limit switch operator head, in combination

a shaft rotatable in opposite directions;

a pair of spaced apart cams rotatably supported on said shaft and each having a driving connection with said shaft such that they are each rotatable in one direction only which is opposite to that which the other is rotatable by said shaft;

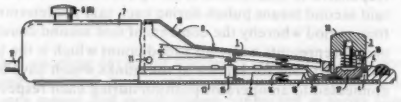
a helically coiled torsion spring concentrically mounted about said shaft and having its opposite ends anchored in respective ones of said cams, said torsion spring acting to return said shaft and said cams to center positions following rotation of said shaft in either direction therefrom, and

spring return retarding means comprising a member which applies a constant frictional force on the outer surface of the coils of said spring to damp the recoiling action thereof.

3,983,344
OPERATED SWITCH CONTROLLER FOR DENTAL ENGINE AND ASSOCIATED APPARATUS

Reinhard Straihammer, Kirschhausen, Germany, assignor to Siemens Aktiengesellschaft, Erlangen, Germany

Filed June 19, 1973, Ser. No. 371,544
Claims priority, application Germany, June 26, 1972, 2231234
Int. Cl.[2] H01H *3/14*; **A61C** *1/00*; **G05G** *9/00*
U.S. Cl. 200—86.5 **15 Claims**



1. Foot control installation comprising a housing; actuating means supported within said housing for pivotal movement in a horizontal plane and having an end portion extending therefrom, said actuating means being horizontally movable between an initial inoperative position and at least one operative

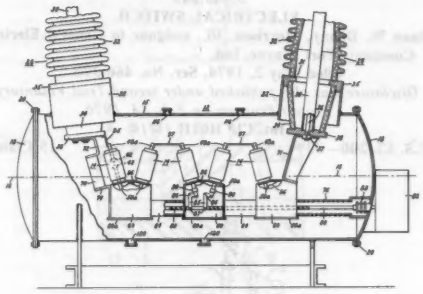
position; foot operator means mounted on the projecting portion of said actuating means for imparting movement to the latter, said foot operator means being imparted a generally linear to slightly concave motion proximate the edge of the housing from which it projects; control and first switching element means operatively connected to said actuating means and adapted to be actuated upon displacement of said actuating means from its initial position; a large-surfaced foot-actuated pressure plate being located at the upper surface of said housing and having downward foot-pressure applied thereto for actuation thereof, said actuating element being positioned in proximity to the path of movement of said foot operator means; and a second switching element being operatively connected to said actuating element so as to be actuated in response to downward foot pressure being imparted thereto.

3,983,345

METHOD OF DETECTING A LEAK IN ANY ONE OF THE VACUUM INTERRUPTERS OF A HIGH VOLTAGE CIRCUIT BREAKER

Virgel E. Phillips, Springfield, Pa., assignor to General Electric Company, Phila., Pa.

Filed Jan. 30, 1975, Ser. No. 545,636
Int. Cl.² H01H *33/66*
U.S. Cl. 200—144 B **7 Claims**



1. A method of detecting loss of vacuum in one or more of the vacuum interrupters of a high-voltage vacuum circuit breaker that comprises: (i) a grounded metal tank containing a gaseous insulator, (ii) a plurality of vacuum interrupters located within said tank within said gaseous insulator and disposed in spaced relationship to the wall of the tank, each vacuum interrupter having spaced-apart terminals and separable contacts respectively connected to said terminals, (iii) means for normally electrically connecting said vacuum interrupters in series, and (iv) high voltage terminal bushings extending through said tank, each including a conductor for connecting the series combination of said vacuum interrupters to an external circuit, said method comprising:

a. operating said circuit breaker in a manner to provide a gap between the contacts of each vacuum interrupter,

b. inserting through the wall of said tank at a first location first rod structure having electrically-connected conductive portions that make electrical connection with predetermined terminals of said interrupters,

c. inserting through the wall of said tank at a second location spaced from said first location second rod structure having electrically-connected conductive portions that make electrical connection with predetermined other terminals of said interrupters,

d. the predetermined terminals with which said first and second rod structures make electrical connection being such as to connect said interrupters electrically in parallel with each other between the conductive portions of said first and second rod structures,

e. maintaining said conductive portions of one of said rod structures insulated from said tank,

f. applying between said first and second rod structures across said interrupters in parallel a test voltage that is of insufficient value to cause a dielectric breakdown between said rod structures externally of said interrupters at the gas pressure then prevailing in the tank but is of sufficient value to produce a high probability of dielectric breakdown within any interrupter stressed by said voltage that has lost its vacuum, and

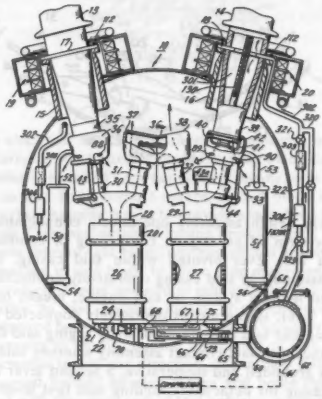
g. determining whether a dielectric breakdown occurs within any of said stressed interrupters when said voltage is applied.

3,983,346

TWO-PRESSURE GAS CIRCUIT BREAKER WITH LOW PRESSURE GAS HEATING

Giovanni Paolo Guaglione, Irvine, Calif., assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed Nov. 22, 1974, Ser. No. 526,416
Int. Cl.² H01H *33/82*
U.S. Cl. 200—148 R **6 Claims**



1. A two-pressure circuit breaker comprising, in combination:

a grounded hollow tank structure which is filled with a gas at relatively low pressure;

a source of relatively high-pressure gas;

means heating said source of relatively high pressure gas;

at least one circuit interrupter mounted within said tank structure and having gas blast valve means therein connected to said source of high-pressure gas and operable to connect said high pressure gas source to the interior of said hollow tank structure during circuit interruption;

first and second terminals for said interrupter which each extend through the wall of said tank structure for enabling the connection of external circuits to said circuit interrupter; at least said first terminal comprising a terminal bushing having an external elongated hollow insulation housing supported by said tank structure and having a hollow elongated conductor extending through said insulation housing and being spaced from the interior walls of said insulation housing to define an elongated annular chamber;

means for isolating said annular chamber from said low-pressure tank structure;

said hollow conductor having one end disposed within said tank structure and communicating with the interior of said tank structure and isolated from said annular chamber and having a second end communicating with said annular chamber;

and means for injecting heated gas from said source of relatively high-pressure gas at relatively low pressure into said annular chamber; said gas injected being free to flow through said annular chamber, into said hollow conductor second end, through said hollow conductor, and into said lowpressure tank structure;

compressor means connected between said source of high-pressure gas and said hollow tank;

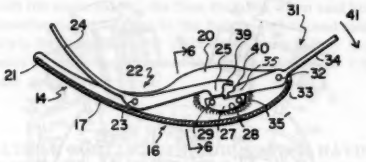
and permanently open restriction means connected between said high-pressure source and said means for injecting gas, restricting the flow of gas into said annular chamber to a given and relatively small volumetric flow.

3,983,347

AUTOMATIC KILL SWITCH ASSEMBLY

Timothy Brenzen, 206 - 641 Staffird St., Winnipeg, Manitoba, Canada

Filed Nov. 11, 1974, Ser. No. 522,461
Int. Cl.² H01H 9/06
U.S. Cl. 200—157 **6 Claims**



1. A kill switch assembly operatively connectable to the ignition system of an engine; comprising in combination a casing, a first lever pivoted within said casing, insulated contact assembly in said casing operatively connected to the associated ignition system of said engine, means to ground said first lever, spring means operatively connected between said casing and said first lever normally urging said first lever into contact with said contact assembly whereby said ignition system is grounded and inoperative, a second lever mounted in said casing for detachably holding said first lever clear of said insulated contact assembly against the pressure of said spring means, and means to disconnect said second lever from said first lever when said first lever is actuated whereby actuation of said first lever disconnects said first lever from said contact assembly against pressure of said spring means.

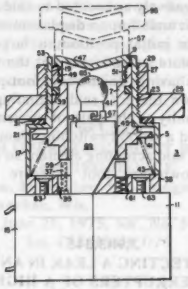
3,983,348

SWITCH OPERATOR

Walter J. Kellogg, Beaver, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 16, 1974, Ser. No. 461,331
Int. Cl.² H01H 9/18
U.S. Cl. 200—314 **9 Claims**

1. A switch operator comprising a tubular base comprising an enlarged portion and a reduced portion having an inturned flange therebetween, a tubular contact actuator movably mounted within the base and having an outturned shoulder, bias means biasing the shoulder in abutment with the inturned flange and disposed on the side of the outturned flange opposite the outturned flange, tubular manual means detachably mounted on said actuator for manually moving said actuator within the tubular base, the tubular manual means having an outer closed end portion, the reduced portion and the tubular contact actuator being in surface-to-surface contact substantially throughout the length of the actuator between the outturned shoulder and the outer closed end portion, said actuator extending into and being enclosed within the enlarged portion on the side of the shoulder opposite the flange, a switch unit including a contact operator adjacent the end portion of said actuator opposite said tubular manual means,



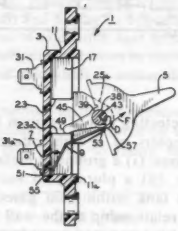
and means including said end portion for actuating the contact operator upon movement of said manual means.

3,983,349

ELECTRICAL SWITCH

Dann W. Denny, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed May 2, 1974, Ser. No. 466,390
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976
Int. Cl.² H01H 19/14
U.S. Cl. 200—339 **15 Claims**



1. An electrical switch comprising a housing, means for controlling a circuit through the housing and operable generally between circuit making and breaking positions, means electrically disassociated from the controlling means and adapted to be selectively momentarily movable in the housing for operating the controlling means, and means for yielding generally as a collapsible column to oppose the selective momentary movement of the operating means including a pair of generally opposite portions respectively mounted between the housing and the operating means to bias the operating means against the controlling means urging it toward one of its circuit making and breaking positions, and a permanent bend in the yielding means for determining the magnitude range of the compressive force of the yielding means in opposition to a momentarily applied force on the operating means to effect the selective momentary movement thereof against the yielding means, and the controlling means assuming the other of its circuit making and breaking positions upon the selective momentary movement of the operating means against the compressive force of the yielding means.

3,983,350

LIQUID CONTACT SWITCH ASSEMBLY INCORPORATED WITHIN WRIST WATCH CASING

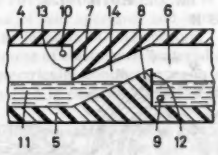
Michel G. Camin, Cortaillod, Switzerland, assignor to Henri Gunzinger-Gunzinger, Welschenrohr, Switzerland

Filed Apr. 14, 1975, Ser. No. 568,115

Claims priority, application Switzerland, Dec. 20, 1974, 17153/74

Int. Cl.² G04B 37/00; H01H 29/04, 29/20

U.S. Cl. 200—61.47 12 Claims



1. An electric switch device for wrist-watches equipped with electric or electronic members and having a case with a sidewall, comprising:

an enclosure assembly having at least one component adapted to be secured in a said wrist-watch, said assembly defining an annular enclosed chamber of a predetermined volume, and

an electricaly conductive liquid confined within said enclosed chamber and having a volume less than said predetermined volume of said chamber,

said assembly comprising two annular electrically insulating parts having complementary L-shaped profiles for forming said annular enclosed chamber when joined, at least one of said insulating parts having an annular shape enabling it to be secured in said sidewall, and said assembly further comprising two electrically conductive parts,

said electrically conductive parts being structurally spaced from one another and each being exposed outside said enclosed annular chamber for connection to said electric or electronic members, and inside said enclosed chamber adapted to be selectively either electrically connected to one another via said liquid or left electrically separated from one another in response to movements of said liquid within said annular chamber depending upon various positions assumed by said assembly,

at least one of said conductive parts comprising a portion made of electrically conductive material accommodated in one of said insulating parts and exposed within said annular chamber only at a predetermined location thereof where it is delimited by a curved surface,

said switch device further comprising at least one baffle element disposed in said enclosed chamber in proximity to said predetermined location for preventing said liquid from coming in contact by simple inertia with said portion made of electrically conductive material when said assembly is subjected to jolts.

3,983,351

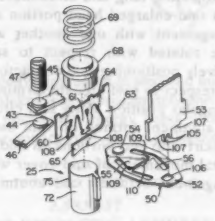
ELECTRICAL SWITCH CONSTRUCTION AND METHOD OF MAKING THE SAME

Werner R. Bauer, Radnor, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Dec. 27, 1973, Ser. No. 428,876

Int. Cl.² H01H 35/40

U.S. Cl. 200—83 R 20 Claims



1. An electrical switch construction comprising a housing means carrying fixed contact means, a snap blade carried by said housing means and carrying contact means to be snapped relative to said fixed contact means as said blade is moved relative to said housing means to provide a switching function, a generally C-shaped actuator having opposed ends disposed on opposite sides of said blade, one end of said actuator being interconnected to said blade to cause snap movement thereof upon movement of said one end of said actuator in one direction relative to said housing means, a compression spring means disposed between said one end of said actuator and said housing means to tend to oppose movement of said one end of said actuator in said one direction, and motion transmitting means carried by said housing means and being operatively associated with the other end of said actuator whereby movement of said other end toward said blade by said motion transmitting means in said one direction causes an initial flexure of said actuator between said ends before said one end is moved sufficiently in said one direction to cause said blade to snap relative to said housing means.

3,983,352

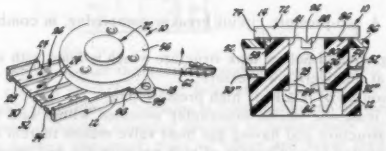
ROTARY SELECTOR SWITCH

Richard B. Ellis, Jr., and James R. Wilson, both of Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed May 12, 1975, Ser. No. 576,465

Int. Cl.² H01H 21/22

U.S. Cl. 200—11 J 3 Claims



3. A rotary-type selector switch comprising: a base member of plastic material having a substantially flat surface with a boss projecting therefrom; a plurality of conductive terminal members attached to said base with arcuate portions arranged

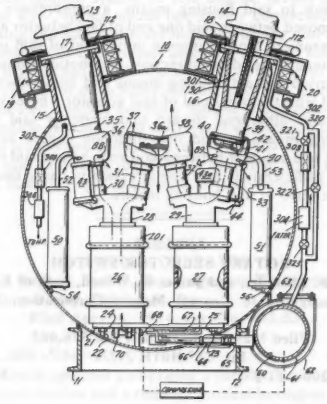
around said boss; said base having raised portions with respect to said flat surface located between and bridging adjacent arcuate portions to define a generally even circular track about said boss; a conductive contactor overlying said terminals and engaging said boss for rotative movement thereabout; contact means extending from the plane of said contactor into engagement with said arcuate terminal portions and raised bridge portions for electrically connecting selective terminal members when said contactor is rotated about said boss; a cover member overlying said contactor and attached thereto for rotative movement together with respect to said base; spring means between said contactor and said cover thereby forcing said contacts into engagement with said arcuate terminal portions; a retainer attached to said boss and having an enlarged head portion overlying said cover to maintain said contactor and cover in spaced relation to said base; means including a projecting tang and circumferentially spaced detents between said enlarged head portion and said cover for selective engagement with one another as said cover and contactor are rotated with respect to said base member thereby positively positioning said contactor and the contacts thereon with respect to said arcuate terminal portions in predetermined angular position along said circular track; means including an abutment formed on said base member and a semicircular skirt with end portions on said cover limiting the extreme pivotal movement of said cover with respect to said base by engagement between said abutment and skirt end portions.

3,983,353

GAS-FILLED HIGH CURRENT BUSHING WITH FORCED COOLING ARRANGEMENT

Giovanni Paolo Guaglione, Irvine, Calif., and Christian Tschannen, Unterentselden, Switzerland, assignors to I-T-E Imperial Corporation, Spring House, Pa.

Filed Nov. 18, 1974, Ser. No. 524,471
Int. Cl.² H01H *33/82*
U.S. Cl. 200—148 R **5 Claims**



1. A two-pressure circuit breaker comprising, in combination:

a grounded hollow tank structure which is filled with a gas at relatively low pressure;

a source of relatively high pressure gas;

at least one circuit interrupter mounted within said tank structure and having gas blast valve means therein connected to said source of high-pressure gas and operable to connect said high pressure gas source to the interior of said hollow tank structure during circuit interruption;

first and second terminals for said interrupter which each extend through the wall of said tank structure for enabling the connection of external circuits to said circuit interrupter; at least said first terminal comprising a terminal bushing having an external elongated hollow insulation housing supported by said tank structure and having a hollow elongated conductor extending through said insulation housing and being spaced from the interior walls of said insulation housing to define an elongated annular chamber;

means for isolating said annular chamber from said low-pressure tank structure;

said hollow conductor having one end disposed within said tank structure and communicating with the interior of said tank structure and isolated from said annular chamber and having a second end communicating with said annular chamber;

means for injecting gas at relatively low pressure into said annular chamber; said gas injected being free to flow through said annular chamber, into said hollow conductor second end, through said hollow conductor, and into said low-pressure tank structure;

compressor means connected between said source of high-pressure gas and said hollow tank;

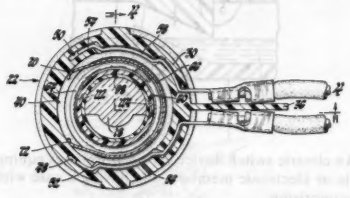
and permanently open restriction means connected between said high pressure source and said means for injecting gas, restricting the flow of gas into said annular chamber to a given and relatively small volumetric flow.

3,983,354

ROTARY ELECTRIC SWITCH

Joseph E. Gammie, Southgate, and Bert R. Wanlass, Warren, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed June 30, 1975, Ser. No. 591,847
Int. Cl.² H01H *19/28*
U.S. Cl. 200—155 R **4 Claims**



1. A rotary electric switch comprising cylindrical housing means of insulating material having an integral circular flange portion defining first and second interior wall surfaces of first and second internal diameters respectively, the second internal diameter being greater than said first internal diameter, an annular groove formed in said flange portion, an O-ring seal located in said annular groove, a first contact blade in abutting relationship with said flange portion and in sealing engagement with said seal, second and third contact blades extending through said housing means, at least a portion of each of said second and third contact blades being exposed to the interior of said housing means, said housing means including a cover portion of insulating material secured at one end of said housing, a cylindrical shaped rotor member of electrically conductive material having a pair of integral flexible fingers extending radially outward therefrom and self-biased into engagement with said second interior wall surface, said fingers being located in transverse plane containing said portions of said second and third contacts so that said fingers engage and disengage with said portions of said second and third contact blades as said rotor is rotated, spring means biasing said rotor away from said cover and into engagement with said first contact blade, a rotor driving and sealing member keyed to said rotor for selectively rotating said rotor in a clockwise or counter-clockwise direction for establishing an electrically conductive path between said first contact blade and said

second or third contact blades through one or the other of said pair of fingers respectively, said first contact blade and said rotor member and said cover portions having axially aligned openings therein, said rotor driving and sealing member including an integrally formed cylindrical flange portion axially extending through the opening of said first contact blade, said rotor member and said cover member and rotatably coupled to said cover member.

3,983,355

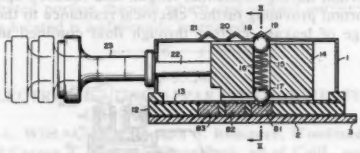
SWITCHING APPARATUS

Masayoshi Hyodo, Aichi, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed June 19, 1974, Ser. No. 480,803

Int. Cl.² H01H *1/02*

U.S. Cl. 200—264 **15 Claims**



1. An electrical switch for selectively opening and closing a plurality of contacts comprising:

a base member formed of an electrical insulating material and having a first surface which defines therein a plurality of apertures,

contact electrode means on said first surface for defining a plurality of circuit paths thereon each of which extends to at least one of said apertures and is normally open circuited at the location of said aperture,

a contact element of elastomeric material of the type which becomes electrically conductive upon compression and being supported in each said aperture in said base member,

and slider means movable laterally over said first surface between preselected positions, said slider means including at least one pressure imparting means which exerts a compression force in a direction normal to the direction of movement of said slider means, said force imparting means being so positioned relative to said apertures in said first surface that in at least one of said preselected positions of said slider means said force imparting means compresses a respective control element and closes a circuit path associated with said aperture.

3,983,356

END LOAD FOR MICROWAVE OVENS

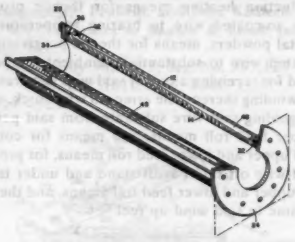
Peter D. Jurgensen, San Carlos, Calif., assignor to Gerling Moore Inc., Palo Alto, Calif.

Filed Apr. 30, 1974, Ser. No. 465,489

Int. Cl.² H05B *9/06*

U.S. Cl. 219—10.55 A **5 Claims**

5. An end load for providing access to a microwave oven having means forming a port through the wall thereof, said end load comprising an inner cylindrical member having an internal dimension corresponding to said port, an outer cylindrical member concentrically supported about said first member, said outer member being made of conductive material to provide an inwardly facing surface reflective to microwaves, said outer conductive member being spaced apart a predetermined distance from said first member thereby defining an annular region therebetween having a thickness of approximately one-fourth of the wavelength of said microwave energy divided by the square root of the dielectric constant of said liquid, means sealably interconnecting the ends of said inner and outer members into a unitary structure, means for interconnecting said end load to said microwave oven such that one end of the bore of said inner member opens into said port of said oven, means forming a liquid inlet and outlet to the region between inner and outer members, said inner member being made of dielectric material having a dielectric constant of approximately the square root of the product of said liquid



and air, means for delivering liquid to said end inlet, said inner member having a thickness of approximately one-fourth of the wavelength of the microwave energy being used within said oven divided by the square root of the dielectric constant of said inner member.

3,983,357

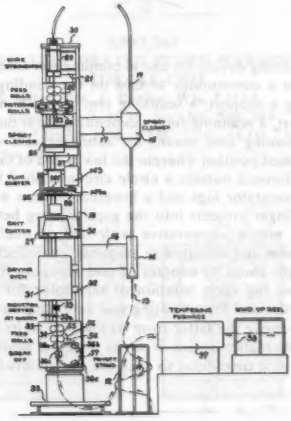
APPARATUS FOR PRODUCING ARMORED ROD AND WIRE SAWS

Paul V. Whitney, Jr., Victoria, Tex.; Robert J. Bolen, Bridgeport, and William W. Cotter, Jr., Stratford, both of Conn., assignors to Remington Arms Company, Inc., Bridgeport, Conn.

Division of Ser. No. 220,294, Jan. 24, 1972, Pat. No. 3,854,898, which is a continuation-in-part of Ser. No. 12,724, Feb. 19, 1970, abandoned. This application Sept. 9, 1974, Ser. No. 504,150

Int. Cl.² B23K *1/04*; B05C *3/12*

U.S. Cl. 219—85 A **8 Claims**



1. Apparatus for the quantity production of armored wire and rod saw stock from wire substrate stock in long lengths suitable for coiling, comprising in combination: an upstanding framework having mounted thereon in substantially vertical wire feeding alignment, pairs of upper and lower feed roll means peripherally grooved for gripping and progressively feeding said wire as freely suspended therebetween, said roll pairs having successively interposed therebetween seriatum on said framework and free from contact with said wire,

means for progressively and peripherally spray cleaning said wire, means for progressively and peripherally applying thereto a coating of a flux adhesive and brazing metal powder slurry, means for thence progressively and peripherally overcoating said slurry coating with a layer of abrasive particles, means for thence progressively drying said coating, high frequency induction heating means for thence progressively heating the so-coated wire to brazing temperature of said brazing metal powders, means for thence progressively cooling the heated wire to substantially ambient temperature, a payoff stand for receiving a coil of said wire substrate, a wind-up reel for winding thereon the armored wire stock, wire guide means for guiding said wire substrate from said payoff stand to said upper feed roll means, and means for concurrently driving said upper and lower feed roll means, for progressively pulling said wire off said payoff stand and under tension between said upper and lower feed roll means, and thence delivering the same to said wind-up reel.

3,983,358

SCANNING DEVICE FOR TIG-SPOT WELDING OF COMMUTATOR SEGMENT LUGS TO TAPS ON ROTOR WINDING

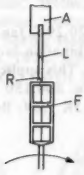
Urs Karlen, Fislisbach, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Nov. 29, 1973, Ser. No. 419,929

Claims priority, application Switzerland, Dec. 12, 1972, 18027/72

Int. Cl.² B23K *9/12*

U.S. Cl. 219—124 **7 Claims**



1. A scanning device for use in conjunction with spot welding lugs on a commutator to taps on the winding of a rotar comprising a support, a scanning arm pivotally mounted on said support, a scanning finger depending from the lower end of said scanning arm, means for actuating said support between a raised position wherein the lower end of said scanning finger is disposed outside a circle circumscribed by the ends of the commutator lugs and a lowered position wherein said scanning finger projects into the gaps existing between adjacent lugs, means cooperative with said pivotally mounted scanning arm and actuated in response to deflection of said arm brought about by contact of said scanning finger with a commutator lug upon rotation of said rotor for releasing a welding order and for activating said actuating means for said support to move the latter from its lowered to its raised position and thereafter return it to its lowered position after a predetermined time delay to scan the next-following commutator lug.

3,983,359

ELECTRICAL FLUID HEATER

John A. Walker, and Dimitri S. Dimitri, both of Northridge, Calif., assignors to Datametrics Corporation, Van Nuys, Calif.

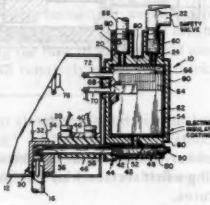
Division of Ser. No. 385,275, Aug. 3, 1973, Pat. No. 3,908,588. This application Sept. 10, 1974, Ser. No. 504,814

Int. Cl.² H05B *3/60*; F24H *1/10*

U.S. Cl. 219—284 **2 Claims**

1. In a fluid heater for heating fluid flowing therethrough by passing electrical current through the fluid, the combination comprising:

a container composed of electrically conductive metal and enclosing a fluid heating chamber for receiving fluid to be heated, said container having spaced apart electrically conductive electrodes positioned within said chamber adapted to be connected to a source of electric power for passing electric current through the fluid within the said heating chamber, said container having a fluid input tube and a fluid output tube, said input tube having an inner section connecting and communicating with said chamber and an outer section adapted for connection to a source of fluid, and said output tube having an inner section connecting and communicating with said chamber and an outer section adapted for connection with a receiver of fluid, said inner portions of said input and output tubes each further including a reduced aperture portion having substantial length, said reduced aperture portion providing further electrical resistance to the passage of leakage current through fluid confined in said



inner sections of said input and output tubes, said chamber having an electrically continuous layer of electrically insulating material covering and insulating the fluid contacting surfaces of said chamber and extending into and covering and insulating the fluid contacting surfaces of the said inner sections of said input and output tubes for directing leakage current from said electrodes through said inner sections of said input and output tubes to thereby limit such leakage current with the electrical resistance of fluid confined within said inner sections of said input and output tubes and a safety port tube having an inner portion connecting and communicating with said heating chamber and on outer portion communicating with an external pressure relief valve, said layer of insulating material extending into and insulating the fluid contacting surfaces of said inner section of said safety port tube, whereby the total leakage current from within said heating chamber consists of the sum of the leakage current through said input tube, said output tube and said safety port tube.

3,983,360

MEANS FOR SECTIONALLY INCREASING THE HEAT OUTPUT IN A HEAT-GENERATING PIPE

Paul F. Offermann, Redwood City, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 27, 1974, Ser. No. 527,796

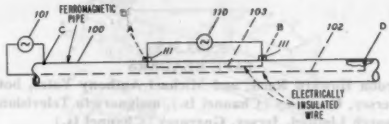
Int. Cl.² H05B *3/00, 5/00*; F16L *53/00*

U.S. Cl. 219—301 **9 Claims**

1. In combination with a heat-generating pipe of the type wherein a ferromagnetic pipe has extending longitudinally through a predetermined length of said pipe a first insulated wire portion connected in series with an alternating current supply means and said predetermined length of ferromagnetic pipe and a return path means through said pipe to said alternating current supply means, the improvement comprising:

a second insulated wire portion parallel to said first insulated wire portion and extending within a selected portion of said predetermined length of ferromagnetic pipe a

distance less than the length of said predetermined length; and means for connecting said second insulated wire portion to said alternating current supply means so that the magnetic field resulting from the current flow from said supply means in said second insulated wire is



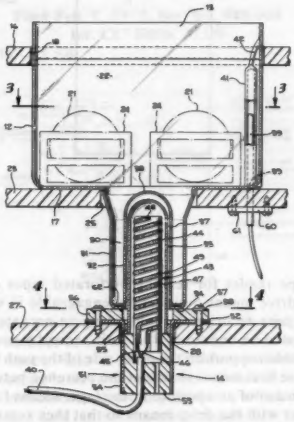
additive to the magnetic field resulting from the alternating current flow in said first insulated wire from said supply means whereby the heat output within said selected portion through which said second insulated wire is located is additionally increased.

3,983,361

ELECTRIC HEATING APPARATUS FOR HEATING CORROSIVE SOLUTIONS

Fred A. Wild, Arcadia; Joseph S. Romance, Woodland Hills, and Carson T. Richert, Buena Park, all of Calif., assignors to Radiant Technology Corporation, Cerritos, Calif.

Filed Mar. 20, 1975, Ser. No. 560,355
Int. Cl.² H05B 1/00; F24H 1/18
U.S. Cl. 219—433 **4 Claims**



1. Apparatus for heating solutions comprising:

a tank having a main body portion with an open top and having on the botton thereof a relatively smaller depending elongated annular cavity portion with a central opening accessible from the bottom thereof, said tank having anchored adjacent the inside wall of the main body portion thereof an upright tube having a closed upper end and an open lower end connected to an opening in the bottom of the tank;

a support means;

a thermocouple fixedly supported in an upright position on said support means; and

a heater unit including a heating coil enclosed in an elongated quartz tube fixedly supported in an upright position on said suport means;

the central opening of the depending annular cavity portion of the tank and the upright tube in said tank each being of such a size and shape that said tank is removably supported on said support means with said central opening freely fitted over said quartz tube and with said upright tube slidably fitted over said thermocouple

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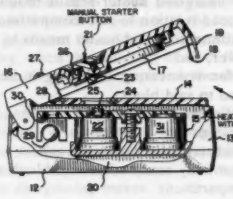
3,983,362

MANUAL SWITCHING MEANS FOR CONTACT LENS DISINFECTING APPARATUS

Paul A. Hoogesteger, Penfield, and John Kadlecik, Macedon, both of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed July 18, 1975, Ser. No. 597,127
Int. Cl.² A61L 3/00; F24C 1/16
U.S. Cl. 219—521 **6 Claims**



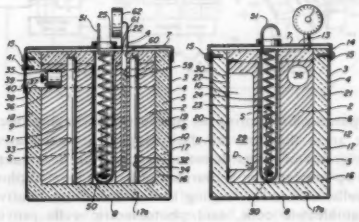
1. A contact lens disinfecting apparatus comprising a housing having a base and a movable cover, the base portion including a heat storage-transfer means and heating means, the housing when the cover is in closed position forming a chamber for a contact lens carrying case, the apparatus further including the combination of a switching means and selectively operable control means for activating the heating means, the switching means disposed in the cover and extending upwardly and downwardly through the cover, the downward end of the switching means being minutely spaced apart from the control means when the cover is in closed position but substantially spaced apart from the control means when the cover is not closed, said switching means being capable of actuating the control means when the cover is in closed position but unable to actuate the control means when the cover is not completely closed.

3,983,363

ELECTRICALLY HEATED SEMEN WARMING AND STORAGE UNIT

Raymond R. Alter, Rte. 1, Darien, Wis. 53114

Filed Feb. 3, 1975, Ser. No. 546,349
Int. Cl.² H05B 3/06; F24C 7/10; A61D 7/02
U.S. Cl. 219—521 **4 Claims**



1. A warming and storage unit for warming and thawing containers of frozen semen and storing such warmed and thawed containers of semen in guns used in the injection of such semen into an animal in artificial insemination operations, said unit comprising

a. a housing of heat-insulating material,

b. a metal block mounted in said housing,

c. said block having

1. an upwardly opening compartment therein for removably receiving such a container of frozen semen to be warmed and thawed, and
2. another outwardly opening compartment of such size as to removably receive at least one such a gun to be stored.

d. said housing having openings therethrough in communication with respective ones of said compartments for affording access to the latter from outside said housing, and

e. means for controllably heating said block to a predetermined temperature;

f. said means for heating comprising
1. electrically energized heater means mounted in said block in spaced relation to said compartments, and
2. means for connecting said heater means to a source of electric power, and

g. said means for connecting including a heat-sensitive switch attached to said block.

h. said first mentioned compartment
1. being elongated,
2. extending substantially vertically, and
3. being substantially centered in said block and

i. said other compartment
1. extending substantially horizontally and opening outwardly through one side of said block, and
2. being disposed in spaced relation to said first mentioned compartment, and

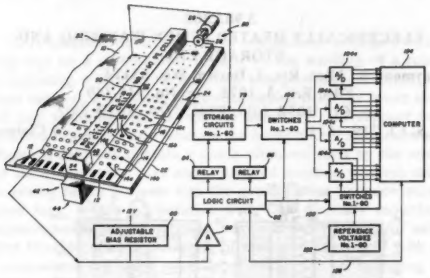
j. said opening which is in communication with said other compartment being disposed in said housing in overlying relation to said one side of said block.

3,983,364

APPARATUS UTILIZING ANALOG-TO-DIGITAL CONVERSION IN THE PHOTOELECTRIC READING OF DOCUMENTS

John D. Firehammer, Burnsville, and Dale W. Gruebele, Bloomington, both of Minn., assignors to National Computer Systems, Inc., Minn.

Filed July 3, 1972, Ser. No. 268,445
Int. Cl.² G06K *5/00*
U.S. Cl. 235—61.6 E **14 Claims**



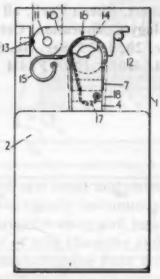
1. Apparatus for scoring an answer sheet having discrete response areas thereon, the darkening of a particular area within a group of areas denoting the answer to a question selected by an examinee, a plurality of fixedly located photoelectric cells, means for feeding the answer sheet relative to said photoelectric cells, said photoelectric cells providing individual analog voltage signals representative of the degree of opacity for the particular areas positioned in juxtaposition to said photoelectric cells so that said areas are sensed by said photoelectric cells, respective means for storing the maximum value of each voltage signal reached during a certain period as said areas move relative to said photoelectric cells, means for converting said stored analog voltage signals to digital signals including a lesser number of analog-to-digital converters than the number of photoelectric cells, the number of said storage means corresponding to the number of photocells, and means for successively connecting said converters to one group of said storage means corresponding in number to the number of converters and then to a second group of said storage means corresponding in number to the number of converters, and means for processing said digital signals to ascertain the correctness or error of a particular answer.

3,983,365

TAPE READERS

Gordon Howard Reed, and Michael Anthony Yates, both of Jersey, Guernsey (Channel Is.), assignors to Television Research Limited, Jersey, Guernsey (Channel Is.)

Filed June 6, 1975, Ser. No. 584,483
Claims priority, application United Kingdom, June 8, 1974, 25525/74
Int. Cl.² G06K *7/06;* **H04L** *15/20;* **H01H** *43/08*
U.S. Cl. 235—61.11 A **10 Claims**



1. A tape reader for reading perforated tapes comprising rotatable drive means peripherally engageable in use with an apertured tape to drive the tape along an arcuate path, first means located on one side of the path, second means mounted on a rotatable support on the other side of the path to co-operate with the first means to detect the presence between it and the first means of an aperture in the tape, means for engaging the support with the drive means so that they rotate together, means for disengaging the support from the drive means after a predetermined rotation of the support from a starting position, and means for returning the support to the starting position after its disengagement from the drive means.

3,983,366

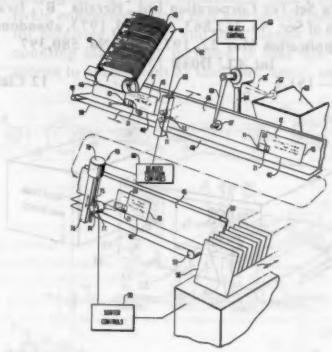
ARTICLE SORTING APPARATUS AND METHOD

Damon M. Gunn, 4007 49th St. NW., Washington, D.C. 20016

Division of Ser. No. 374,171, June 27, 1973, which is a division of Ser. No. 91,701, Nov. 23, 1970, Pat. No. 3,757,942. This application Mar. 18, 1975, Ser. No. 559,610
Int. Cl.² G06K *7/015, 7/14, 7/08*
U.S. Cl. 235—61.11 R **5 Claims**

1. A code reading device comprising a reading head for reading information code marks as measured from a basic point, location means for establishing the location and orientation of said basic point with respect to said information code marks, said basic point being printed with a material which is

physically sensed differently from the way said information marks are sensed and, means for adjusting said reading by said



reading head, with respect to said information code marks, to the location of said basic point.

3,983,367

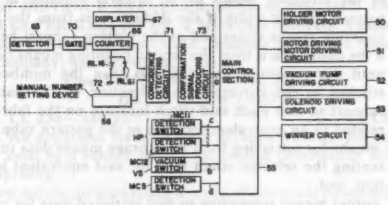
SHEET COUNTING MACHINE

Takashi Kondō; Motoaki Fukunaga, and Hisashi Kitakami, all of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Japan

Filed Feb. 7, 1975, Ser. No. 548,080

Int. Cl.² H03K *21/36*

U.S. Cl. 235—92 SB **1 Claim**



1. In a sheet counting machine having a counting means for counting a number of sheets being separated one by one from a stack of sheets held in a sheet holder; a number setting means for setting in advance a number of sheets desired to be counted; a coincidence detecting means to which said counting means and said number setting means are coupled for producing, when a count value obtained by said counting means coincides with the numerical value set in said number setting means, a coincidence detection signal; a completion detecting means for detecting, when the operation of counting all of the sheets in a stack held by said holder has been completed, the completion of said counting operation and producing a completion detection signal; and a control means to which said coincidence detecting means and said completion detecting means are coupled for controlling a sheet counting operation in cooperation with said counting means, said control means:

a. automatic stop mode means for controlling the machine in an automatic stop mode and responsive to the coincidence detection signal produced by said coincidence detecting means for stopping the sheet counting operation of said machine when the count value obtained by said counting means coincides with the numerical value set in said number setting means;

b. alarm mode means for controlling the machine in an alarm mode and including alarm means and means responsive to the coincidence detection signal produced by said coincidence detecting means for inhibiting the stopping of a sheet counting operation through said control means and responsive to the completion detection signal produced by said completion detection means for stopping the sheet counting operation when an operation of counting all of the sheets in a stack held in said holder is completed, and if during this operation no coincidence detection signal is produced by said coincidence detecting means operating said alarm means; and

c. count mode designating means for controlling the machine in a count mode and including means for inhibiting the sheet counting operations effected by operation of said automatic stop mode means and said alarm mode means, and means responsive to the completion detection signal produced by said completion detecting means for stopping, when the counting of all of the sheets in a stack held in said holder is completed, the sheet counting operation,

whereby sheets in a stack held in said holder are counted in a desired mode selected from among said automatic stop mode, alarm mode, and count mode by selective operation of said automatic stop mode means, alarm mode means and count mode designating means.

3,983,368

APPARATUS FOR NON-TRAUMATIC DETERMINATION OF THE MASS AND THE POSITION OF THE CENTER OF GRAVITY OF A BODY

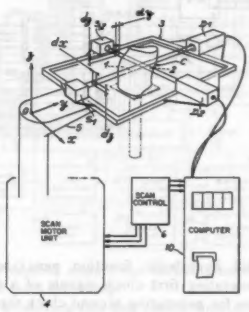
Etienne Csakvary, Maurepas, and André Pascal, Palaiseau, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 13, 1974, Ser. No. 450,564

Claims priority, application France, Mar. 19, 1973, 73.09762

Int. Cl.² G01T *1/20*

U.S. Cl. 235—151.3 **3 Claims**



1. A device for determining the mass and the position of the center of gravity of an object comprising:

at least one source of electromagnetic radiation which emits a beam of said radiation in a first predetermined direction, said first direction being the same for each source in the case of plural sources, and a corresponding number of detectors which serve to detect said radiation and each of which receives one of said beams,

at least one source of electromagnetic radiation which emits a beam of said radiation in a second predetermined direction substantially perpendicular to said first predetermined direction,

a movable support frame rigidly fixed to and mounting all of said sources and said detectors,

means for moving said support frame with reference to a fixed base and with reference to said object linearly in at

least two mutually perpendicular directions in such a manner as to cause said beams to scan all of said object,

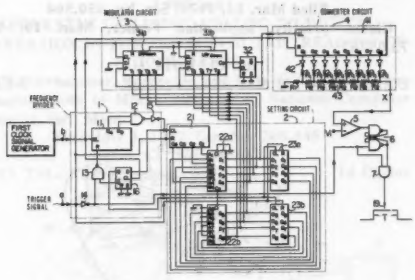
a system for determining the coordinates of the sources with respect to a reference trihedron during the scanning operation of said frame moving means, and

calculating means comprising on the one hand stages for calculating the logarithm of the respective ratios between the intensity I_0 received by each detector when said detector is in inobstructed view of the source and the intensity I received by the same detector when the object is interposed between the source and the detector and, on the other hand, an assembly for calculating the coordinates of the center of gravity of the object, said calculating assembly being connected to and responsive to the outputs of said system for the determination of coordinates and to the outputs of said calculating stages.

3,983,369
DIGITAL HYPERBOLIC FUNCTION GENERATOR

Ritsu Katsuoka, Okazaki, and Hisasi Kawai, Toyohashi, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed May 20, 1975, Ser. No. 579,052
Claims priority, application Japan, July 20, 1974, 49-83694
Int. Cl.² G06F *15/34*
U.S. Cl. 235—150.53 **4 Claims**



1. A digital hyperbolic function generator comprising means for generating first clock signals of a first fixed frequency, means for generating second clock signals at a fixed time interval, a setting circuit, the setting of which is varied with the number n of the second clock signals, said setting circuit producing said setting in a binary code, a modulating circuit connected to said setting circuit for frequency modulating the first clock signals in response to said setting to produce third clock signals, the period of which is proportional to

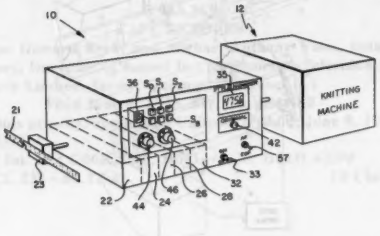
$$1 + n + \sum_{r=1}^{n} r$$

and is shorter than that of said second clock signals, and a converter circuit connected to said modulating circuit for producing a voltage corresponding to said number of said third clock signals, whereby a hyperbolic function of polygonal line approximation, the gradient of which changes at a fixed time interval, is generated.

3,983,370
TEXTILE MACHINE CONTROLLER

Amiram Caspi, and Michael N. Kahn, both of Tel-Aviv, Israel, assignors to Sci-Tex Corporation Ltd., Herzlia "B", Israel

Continuation of Ser. No. 352,863, April 20, 1973, abandoned.
This application May 22, 1975, Ser. No. 580,397
Int. Cl.² D04B *15/78*
U.S. Cl. 235—151.1 **12 Claims**



1. A controller for controlling a textile machine having stitching elements to make a patterned fabric comprising

A. first means for storing data representing the stitch types comprising a subpart of the pattern on the fabric,

B. means for determining the location of each stitch on the fabric, said location determining means including

1. first means for counting the number of stitches formed by the machine in a given row between an index location and the given stitch, and

2. second means for counting the number of stitches formed by the machine in a given column between an index location and the given stitch,

C. means for repetitively reducing the count in at least one of the counting means by an integral multiple of the pattern subpart width if the deduction is from the first counting means count and of the pattern subpart height if the deduction is from the second counting means count until the remaining count is less than the number of stitches in the corresponding direction of the pattern subpart so that each said stitch location on the fabric is related to an equivalent location in the pattern subpart,

D. means for retrieving from the storage means data representing the selected stitch type for said equivalent location, and

E. output means responsive to said retrieved data for causing textile machine stitching elements to form the selected stitch type at said determined location on the fabric.

3,983,371
APPARATUS AND METHOD FOR DETERMINING THE PROPORTION OF DEFECTIVE WIRE IN A LENGTH OF MOVING WIRE

J. Donald Siranni, Sugar Run, and Charles W. Smith, Bethel Park, both of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jan. 6, 1975, Ser. No. 538,869
Int. Cl.² G01B *19/32*; **G01N** *27/82*
U.S. Cl. 235—151.3 **13 Claims**

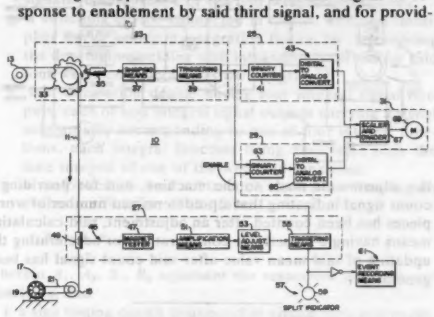
1. An apparatus for determining the proportion of defective wire in a length of wire moving along an established path, said apparatus comprising:

first detection means positioned relative to said established path of travel of said moving wire for providing a first pulse signal having a pulse rate proportioned to the rate at which said wire travels along said path;

first summing means including a binary counter operatively connected to said first detection means for counting the pulses of said first signal and for providing a second signal in digital output form representative of the length of said wire moving along said established path;

second detection means positioned relative to said established path for providing a third signal indicative of defective portions of said moving wire;

second summing means including a binary counter operatively connected to said first and second detection means for receiving said first and third signals respectively, for counting said pulses included in said first signal in response to enablement by said third signal, and for providing a fourth signal in digital output form representative of the length of said defective portions of said wire moving along said established path; and



computation means operatively connected to said first and second summing means for receiving said second and fourth signals respectively, and for providing an output indication of a ratio thereof representative of the proportion of said length of said defective portions of said wire to said length of wire moving along said established path.

3,983,372

APPARATUS AND METHOD FOR A DIGITAL READOUT OF DISTANCE TRAVELED, FUEL CONSUMED AND MILES PER GALLON OF A MOVING MOTOR VEHICLE

Rudolf F. Klaver, Albany, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Feb. 3, 1975, Ser. No. 546,664

Int. Cl.² G10M *15/00*

U.S. Cl. 235—150.21 **12 Claims**

1. An apparatus for indicating distance traveled per unit of fuel used by a vehicle having an internal combustion engine, comprising:

first means for generating a series of electrical pulses related to a given unit quantity of fuel flowing to said engine;

second means for generating a series of electrical pulses related to a given unit of distance traveled by said vehicle;

means for summing the series of pulses from said second means to form a distance-traveled sum;

singular means for displaying said distance-traveled sum accumulated up to emission of a pulse from said first means so that said distance-traveled sum is equivalent to distance traveled per unit of fuel flowing to said engine;

means for replacing a first distance-traveled sum with a subsequent distance-traveled sum on said means for displaying when each subsequent pulse from said first means is received by said means for summing so that semi-instantaneous distance traveled per unit of fuel flowing to said engine is displayed.

3,983,373

ARTICLE CONTROL SYSTEM

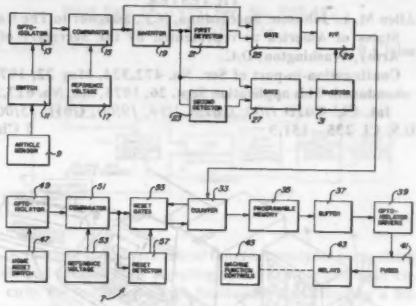
David S. Russell, Lakewood, Colo., assignor to Columbine Glass Company, Inc., Wheatridge, Colo.

Filed Apr. 30, 1975, Ser. No. 572,977

Int. Cl.² G05B *11/00;* **B65G** *57/00*

U.S. Cl. 235—151.3 **20 Claims**

1. A control system for use with a palletizing apparatus, comprising: article sensing means for producing a signal indicative of the sensed presence of an article; logic means connected with said article sensing means for verifying the presence of an article and producing a signal indicative thereof; counter means for counting in response to a signal received from said logic means; memory means for receiving said



counter output and providing outputs at predetermined times; and driver means responsive to said outputs from said memory means for providing output signals for effecting predetermined palletizing functions.

3,983,374

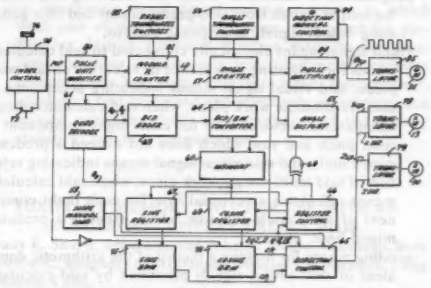
DIGITAL SYSTEM FOR SLOPE AND CURVATURE CONTROL

Andrew J. Sorensen, III, Granada Hills, and John A. Robinson, Chatsworth, both of Calif., assignors to Uresco, Inc., Downey, Calif.

Filed June 20, 1975, Ser. No. 588,663

Int. Cl.² G01N *29/04;* **G06F** *15/20*

U.S. Cl. 235—151.3 **20 Claims**



1. A digital control system for indexing an operating unit along a sloped path including:

a memory for storing sine and cosine functions,

means for indicating an input angle corresponding to the slope of said path,

a sine register and a cosine register,

means responsive to the input angle for addressing said memory to load the sine and cosine functions of said input angle into said respective sine registers and cosine register,

index control means for providing a number of clock pulses corresponding to the distance said operating unit is to be indexed along said sloped path,

a sine proportion means and a cosine proportion means each passing portions of said clock pulses in accordance with the functions loaded in said respective sine register and cosine register, and

a vertical axis stepping motor means and a horizontal axis stepping motor means simultaneously responsive to the portions of the clock pulses passed by said respective sine

proportion means and cosine proportion means for indexing said operating unit along said sloped path.

3,983,375

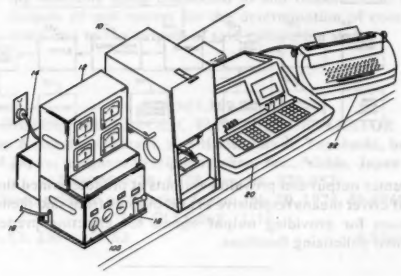
TILTESTER

Allen M. L. Johnson, Succasunna, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 472,324, May 22, 1974, abandoned. This application Sept. 26, 1975, Ser. No. 617,214

Int. Cl.² G01D *1/00;* **G01M** *1/14, 19/00;* **G01L** *15/00*

U.S. Cl. 235—151.3 **7 Claims**



1. An apparatus for measuring a composite effect of tilt, in individual nozzles of a rocket, on spin, pitch and yaw in a multi-nozzle work piece for determining acceptance or rejection of said work piece which comprises:

housing means;

electro-pneumatic gaging menas, operatively disposed in said housing means, for determining the magnitude and direction of said tilt of said individual nozzles;

programmable calculator means for receiving and storing the output signals from said gaging means and then generating output signals in response thereto;

visual signal means electrically connected to said calculator means for indicating acceptance or rejection of said work piece, said visual signal means indicating acceptance of said multi-nozzle work piece, when said calculator means calculates a vectorial sum for each flight component of spin, pitch and yaw which does not exceed a predetermined limit, and said visual signal means indicating rejection of said multi-nozzle work piece, when said calculator means calculates a vectorial sum for each flight component of spin, pitch and yaw which exceeds a predetermined limit; and

printing means for making a record of the arithmetic equivalent of said output signals produced by said calculator means.

3,983,376

CONTROL DEVICE FOR A MACHINE TOOL

Mario Pozzetti, Bologna, Italy, assignor to Finike Italiana Marposs-Soc. In Accomandita Semplice di Mario Possati & C., Bentivoglio, Italy

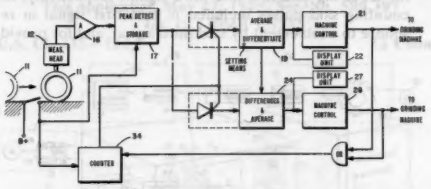
Continuation of Ser. No. 455,494, March 27, 1974, which is a continuation of Ser. No. 273,710, July 21, 1972, abandoned. This application Nov. 15, 1974, Ser. No. 524,212

Claims priority, application Italy, July 30, 1971, 3487/71

Int. Cl.² B24B *49/04*

U.S. Cl. 235—151.13 **6 Claims**

1. An apparatus for controlling a machine tool comprising a measuring head for measuring a given dimension of the successive workpieces machined by the machine tool; detecting and storing means for detecting workpieces being measured and storing a signal representing the successive values of the dimensions of the workpieces measured by said measuring head; calculating means connected to said detecting and storing means for calculating a mean value of said successive values; control means connected to said calculating means for controlling the machine tool; and counting means connected with said detecting and storing means, said calculating means, and said control means for receiving information regarding



the adjustments made to the machine, and for providing a count signal indicating that a predetermined number of workpieces has been counted after an adjustment, said calculating means having a presettable configuration for accelerating the updating of said mean value after said count signal has been generated.

3,983,377

METHOD AND APPARATUS FOR DETECTING A FAULT LOCATION AT AN ELECTRICAL CONDUCTOR

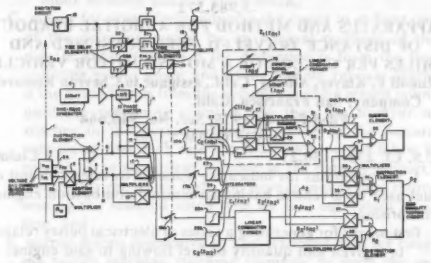
Michael Vitins, Zurich, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed June 30, 1975, Ser. No. 591,343

Claims priority, application Switzerland, July 8, 1974, 9361/74

Int. Cl.³ G01R *31/08;* **G06G** *7/12*

U.S. Cl. 235—151.31 **18 Claims**



12. An apparatus for detecting a fault location at an electrical conductor for measurement voltages and measurement currents received at the measurement location following an error-indicating excitation signal, comprising, the combination of:

a. an excitation circuit having an error-indicating excitation signal as the output;

b. measurement elements for the measurement of a measurement voltage and measurement current at a predetermined measurement location;

c. a multiplier connected in circuit with the measuring element for measurement of the measurement current for forming a signal representative of the product of the characteristic impedance of the conductor and the measurement current;

d. an additional and subtraction circuit connected in circuit with said multiplier and having two outputs, a first output thereof carrying a signal substantially corresponding to a first wave function and a second output thereof carrying a signal substantially corresponding to a second wave function;

e. a multiplier device provided with inputs for at least one signal which is substantially sinusoidal as a function of time and for the signals corresponding to the first and second wave functions, said multiplier device having

outputs at which there appear signals representative of four weighted functions in the form of the products of the first wave function and two substantially sinusoidal-type signals and the second wave function and two substantially sinusoidal-type signals;

f. an integration device having inputs for receiving said signals representative of the four weighting functions;

g. a switching device connected in circuit with said multiplier device and said integration device for determining the duration coinciding with integration intervals for said four weighted functions as the integrands;

h. said integration device having four integral signal outputs, each of said integral signal outputs carrying a signal substantially corresponding to one of four integral functions, each integral function being associated with the time integral of one of the weighted functions;

i. a multiplication and subtraction device for forming an evaluation function of the form:

$$A_1B_2 - A_2B_1$$

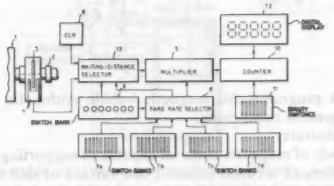
wherein A_1, A_2, B_1, B_2 represent the respective four integral functions; and

j. a sign testing circuit connected in circuit with said multiplication and subtraction device for delivering an output signal representative of the direction of the position of the fault location with respect to a reference location.

3,983,378
METHOD AND APPARATUS FOR MEASURING TAXI FARES

Tapio A. Tammi, Oulu, Finland, assignor to Kajaani Oy, Elektronika, Oulu, Finland

Continuation-in-part of Ser. No. 455,936, March 28, 1974. This application Oct. 1, 1974, Ser. No. 511,009
Claims priority, application Finland, Mar. 30, 1973, 988/73
Int. Cl.² G07B *13/00*
U.S. Cl. 235—151.32 **10 Claims**



1. A meter for measuring a fare in a taxi vehicle comprising:

a binary multiplier having two signal input channels and a signal output channel;

means for producing a series of electrical pulses related to use of the taxi vehicle connected to be applied to one signal input channel;

a plurality of banks of binary switch means for preadjustment to different positions with each bank adjusted to calibrate the meter when operating in the taxi vehicle, wherein each bank of binary switch means comprises a plurality of two position switches manually operable for calibration of the meter for operation in a particular taxi vehicle as well as for calibration of the meter to correspond to a different approved fare rate schedule;

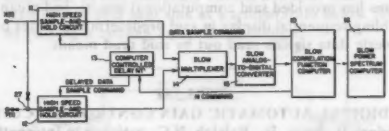
a manually operable switch disposed for operation by the taxi driver each time the taxi is hired to connect a predetermined one of said banks of binary switch means to the other signal input channel to control said binary multiplier in accord with the approved selected fare rate schedule; and

an indicating device connected to be responsive to the electrical pulses in the output signal channel for displaying the fare.

3,983,379
RANDOM SAMPLE STATISTICAL FUNCTION ANALYZER

Paul F. Scott, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 18, 1975, Ser. No. 550,452
Int. Cl.² G06F *15/34*
U.S. Cl. 235—152 **10 Claims**



1. A random sample statistical function analyzer comprising

first and second high sampling speed sample-and-hold circuits for sampling a high bandwidth signal having a frequency exceeding 100 kilohertz which is representative of a stationary ergodic process, and a digital delay circuit connected to an input of said second sample-and-hold circuit for generating variable delay intervals,

said first and second sample-and-hold circuits being repetitively operative in response to first commands each applied to said first sample-and-hold circuit and digital delay circuit to obtain a large number of randomly sampled pairs of analog data samples with a predetermined digital delay between each sample pair as determined by second commands each selectively applied to said digital delay circuit,

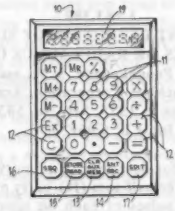
slow processing speed multiplexer and analog-to-digital converter means connected to the outputs of said sample-and-hold circuits for processing each pair of analog data samples and producing a pair of digital representations thereof, and

slow processing speed digital computer means to which each pair of digital representations is supplied for performing desired statistical function estimate computations including at least autocorrection function estimate computations, said digital computer means further generating each first command and selectively generating each second command following completion of the desired statistical function computations.

3,983,380
AUXILIARY MEMORY UNIT FOR USE WITH AN ELECTRONIC DISPLAY CALCULATOR

Louay E. Sharif, Atherton, and John R. Moore, Pasadena, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Aug. 11, 1975, Ser. No. 603,401
Int. Cl.² G06F *3/14, 3/02, 7/38*
U.S. Cl. 235—156 **19 Claims**



1. In an electronic calculator having a keyboard with a plurality of digit keys and arithmetic function keys for generating signals representative of numeric data and functions to

be performed on said data, calculator means for receiving said signals and performing said functions with said numeric data to provide computational results, and display means for displaying said numeric data and said results, the improvement comprising auxiliary store means for sequentially storing and retaining successively generated ones of said numeric data and function signals in accordance with the order of generation thereof, read means for sequentially reading out at least some of said signals in a predetermined order after said calculator means has provided said computational results, and means for enabling sequential display in said predetermined order of the numeric data signals read out by said read means.

3,983,381

DIGITAL AUTOMATIC GAIN CONTROL CIRCUIT

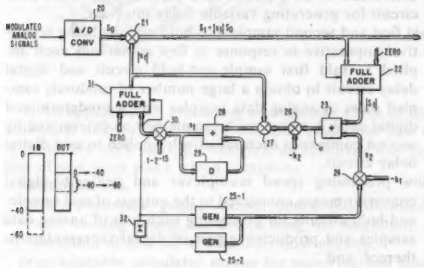
Gardner D. Jones, Jr., Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 18, 1974, Ser. No. 534,016

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.[2] G06F *5/00*

U.S. Cl. 235—154 12 Claims



1. A digital gain control circuit suitable for use in a digital signal processor such as a digital demodulator comprising:

a multiplier for forming the product of an uncontrolled digital input signal and a digital gain control signal;

a feedback loop responsive to the magnitude of the output of the said multiplier and a digital reference for generating the said digital gain control signal;

said feedback loop including;

means for forming an error signal corresponding in magnitude and sign to the difference between the magnitude of the multiplier output and the said reference;

accumulator means responsive to said error signal for generating said gain control signal; and

a feedback control loop responsive to the sign of the accumulator output for modifying the sign of the reference to cause said error signal to assume alternate negative and positive fixed values when the multiplier output falls to zero for a predetermined period of time.

3,983,382

ADDER WITH FAST DETECTION OF SUM EQUAL TO ZEROES OR RADIX MINUS ONE

Arnold Weinberger, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 2, 1975, Ser. No. 583,023

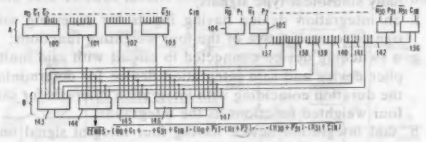
Int. Cl.[2] G06F *7/50*

U.S. Cl. 235—173 18 Claims

1. A logic system for determining a binary sum of all zeros which makes use of the half-sum (H), carry propagate (P) and carry generate (G) pulses of each bit position in said sum together with a low order input carry signal C_{in}, comprising

first logic circuit means for combining H and G pulses,

second logic circuit means for combining H, P and C_{in} pulses, and third logic circuit means for combining the outputs of said first and second logic circuit means and said input carry signal C_{in}, said first, second and third logic circuit means connected to receive and combine pulse inputs according to



$$\text{ZEROS} = (\overline{H}_0 + G_1 + \ldots G_{n-1} + C_{in}) \cdot (H_0 + \overline{P}_1) \cdot \ldots (H_{n-2} + \overline{P}_{n-1}) \cdot (H_{n-1} + \overline{C}_{in})$$

where the subscripts 0 to $n-1$ refer to bit positions, high to low order, respectively, in an n-bit sum.

3,983,383

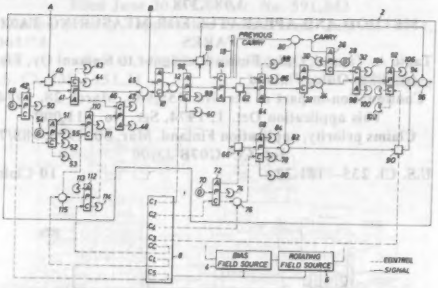
PROGRAMMABLE ARITHMETIC AND LOGIC BUBBLE ARRANGEMENT

Rex Alan Naden, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 10, 1974, Ser. No. 468,963

Int. Cl.[2] G06F *7/50*; G11C *11/14*

U.S. Cl. 235—176 11 Claims



1. A programmable magnetic bubble arithmetic and logic arrangement comprising:

a substrate,

a body of magnetic material capable of supporting magnetic domains secured adjacent one surface of said substrate,

said magnetic material having bubble propagation path pattern means arranged for the selective performance of serial arithmetic and logic operations on two streams of digital information provided as magnetic bubble domains,

periodic drive means coupled to said body for providing a step movement of bubbles through said bubble propagation path pattern means of said magnetic material,

said bubble propagation path pattern means of said magnetic material including

a plurality of transient bubble switches for respectively receiving a first and second bubble input and passing bubbles in said first input therethrough along a control path, bubbles in said second input passing therethrough along a preferred path when there is simultaneously a bubble void in said first input, bubbles in said second input passing therethrough along an alternate path when there is simultaneously a bubble occurrence in said first input,

a plurality of bubble generators for respectively producing a bubble domain at each periodic step,

a plurality of bubble annihilators for respectively annihilating bubble domains applied thereto,

a plurality of exclusive merge elements for respectively permitting bubbles from two inputs occurring nonsimultaneously to pass therethrough to a single output,

a plurality of crossover elements for respectively permitting bubbles from two inputs to pass therethrough to two respective outputs without interference,

a plurality of resident bubble switches for respectively receiving a first and second bubble input, a bubble in said first input lodging in a control path until a subsequent bubble causes expulsion thereof, bubbles in said second input passing therethrough along a preferred path when there is a simultaneous bubble void in said first input, bubbles in said second input passing therethrough along an alternate path when there is a simultaneous bubble occurrence in said first input, and

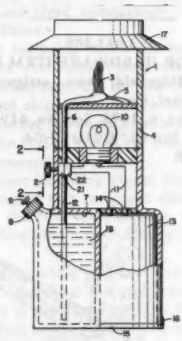
said transient bubble switches, bubble generators, annihilators, merge elements, crossover elements and resident bubble switches being interconnected in at least partially defining said bubble propagation path pattern means in such a manner to achieve a plurality of arithmetic and logic operations on two streams of digital information, programming thereof being at least in part by lodging bubbles in the control paths of appropriate resident bubble switches.

3,983,384

COMBINATION LANTERN

Archangelo Joseph Bucci, Bayonne, N.J., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed May 13, 1975, Ser. No. 577,067
Int. Cl.² F21V *19/04*
U.S. Cl. 240—37 **6 Claims**



1. A portable light source comprising a battery, a selector switch, an incandescent lamp, a combustible fuel, a valve, a knob, a series electrical circuit including said selector switch and said incandescent lamp and said battery, piping fluidly connecting said combustible fuel to said valve and to a point of combustion, said knob for manual operation of said valve and said selector switch, said knob capable of being manually disposed closing the terminals of said selector switch and closing said valve, said knob capable of being manually disposed opening said terminals of said selector switch and opening said valve, said knob capable of being manually disposed opening said terminals of said selector switch and closing said valve.

3,983,385

METHOD AND APPARATUS FOR OPERATING A MERCURY VAPOR LAMP

Harden Henry Troue, Plainfield, Ind., assignor to Union Carbide Corporation, New York, N.Y.

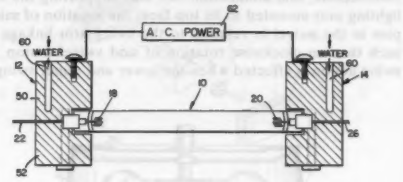
Continuation of Ser. No. 499,932, Aug. 23, 1974, abandoned.
This application Nov. 17, 1975, Ser. No. 632,633
Int. Cl.² H01J *61/52*
U.S. Cl. 240—47 **6 Claims**

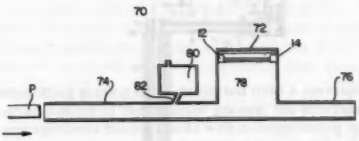
1. A method for continuously operating at least one mercury vapor UV lamp in any gaseous environment existing in a confined optical enclosure; said lamp consisting of a single elongated quartz envelope, a quartz to metal seal at each end and an exposed terminal at each end; the improvement comprising the steps of:

a. providing at least one thermally conductive heat sink independent of said lamp and locating said heat sink so that it does not contact said single elongated quartz envelope;

b. mechanically connecting only each exposed terminal of said lamp to said thermally conductive heat sink;

c. maintaining said heat sink at a temperature below 100°C by passing a cooling liquid therethrough;





d. and locating said heat sink in such close physical proximity to said quartz to metal seal so that the seal temperature is held below 400°C.

4. Apparatus for photopolymerizing chemical coatings comprising an enclosure having a radiation chamber therein; an inlet tunnel to said radiation chamber and an outlet tunnel from said radiation chamber; a plurality of terminal assemblies mounted in said radiation chamber; a plurality of mercury vapor lamps having sealed ends and exposed power terminals mounted in said terminal assemblies so that the exposed power terminals only are connected to the terminal assembly; each of said terminal assemblies having water passages therein for carrying cooling water sufficiently close to the power terminals of said mercury vapor lamp to keep said sealed ends below a temperature of 400°C.

3,983,386

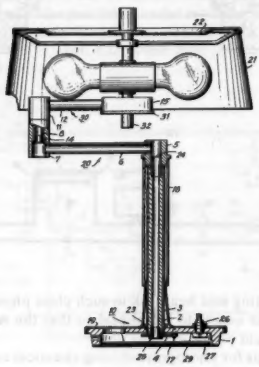
SWING ARM LAMP

Fred Schallenkammer, 107-18 101st Ave., Ozone Park, N.Y. 11416

Filed May 7, 1975, Ser. No. 575,242
Int. Cl.² F21S *1/12*
U.S. Cl. 240—81 R **1 Claim**

1. In a combination swing arm lamp structure a round tubular stem extending vertically upward from a heavy base and protruding slightly into a recess at the bottom of said base; said stem serving as a sleeve bearing for an inner tube rotating within it and resting with a cap fastened to its top end on the open top end of said tubular stem and said cap supporting the entire swing arm linkage branching horizontally from it; said inner tube extending thru the entire length of said tubular stem and having a shoulder recess turned on its bottom end which protrudes slightly beyond the bottom end of said tubular stem when assembled together, and having a lug washer fastened to said shoulder recess; said lug washer having a protruding lug engaging on counter clockwise rotation, a stop pin in the bottom recess of said lamp base when the swing arms are folded up and extending toward the rear; said swing arm linkage comprising a tubular arm extending horizontally

from said cap and terminating in the bottom portion of a swivel having a hole thru its center serving as a sleeve bearing for a tubular stem extending from the rotating top portion of said swivel whose rotation is confined to less than one revolution by means of stop pins mounted on the joint faces; one of said stop pins being mounted on the top face of said fixed bottom portion of said swivel and extending into an annular recess at the bottom face of said rotating top portion of said swivel where it engages a pin mounted in said recess for a positive stop of rotation; from said rotating top portion of said swivel extending horizontally, a tubular arm which terminates in a shallow drum-shaped box for intermediate electrical wire connections, said connection box also supporting the shaded lighting unit mounted to its top face; the location of said stop pins in the swivel in relation to the swing arm linkage being such that on clockwise rotation of said swivel a stop to the swing action is effected when the lower and upper swing arms



are folded in closed position, that is, one above the other, the top and bottom portions of said swivel being held together with a minimum of end play by a flanged nipple screwed into the bottom end of said rotating tubular stem; for proper swing operation the direction of rotation of said inner tube of the lamp post being the opposite of the direction of rotation of said swivel portion; fastened to said cap connected to the top end of said inner tube a tubular handle which is open at its bottom end and extends downward amply clearing on rotation said tubular stem which extends upward from said stationary lamp base; said handle, said cap and said inner tube being fastened together for rotating in unison when swinging said interconnected lower swing arm, lifting the lamp by said handle arresting the primary swing action pivotally about said lamp stem permitting only said shaded lighting unit to be swung pivotally about said swivel thus preventing any uncontrollable flapping about of the swing arm linkage.

3,983,387

CONCEALED, SPRING-LOADED, SLIDE HINGE FOR LUMINAIRE DOOR

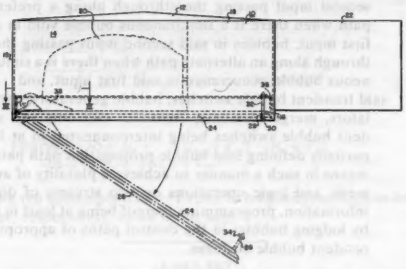
Frank Van Steenhoven, Peninsula, and Adolf Meeuwen, Kent, both of Ohio, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 10, 1975, Ser. No. 585,734
Int. Cl.² F21V *17/00*
U.S. Cl. 240—147 **7 Claims**

1. In a luminaire including a housing having side and end walls and a light transmitting door including a door frame contiguous with said side and end walls of said housing, an improved door mounting means comprising:

a pair of spaced hinge hooks on one end wall of said housing;

hidden hinge means on said door frame adjacent each of said hinge hooks for mounting said door to said housing, said hidden hinge means including a pair of hinge slides mounted to said door frame sides, a hinge arm mounted to each of said hinge slides for relative sliding movement therebetween, spring means interconnecting each of said



hinge arms to said door frame and urging said hinge arms toward said one end wall, and a pivot pin mounted to each of said hinge arms constructed and arranged to mount said hidden hinge means to said pair of spaced hinge hooks; and

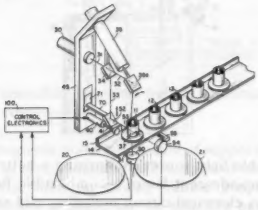
latch means for latching the other end of said door frame to said housing.

3,983,388

APPARATUS FOR HARDWARE ITEM INSPECTION

George Gugliotta, Ridgefield, Conn., assignor to Automation Systems, Inc., Bethel, Conn.

Filed Oct. 6, 1975, Ser. No. 619,785
Int. Cl.² G01D *21/04*
U.S. Cl. 250—223 R **3 Claims**



1. Nut inspection apparatus for monitoring the height of nuts and adaptable to also determine if threading is present on the inner surface thereof, comprising:

a. a ramp for carrying said nuts, said ramp having a slot which defines an inspection position;

b. means for generating a laser beam;

c. means for splitting said laser beam into first and second beams;

d. adjustable means for directing said first beam transverse said ramp and over said slot at the inspection position, said means being adjustable to a predetermined position above said ramp;

e. a first photodetector for receiving said first beam in the absence of a nut of prescribed height at the inspection position;

f. means for directing said second beam toward the inner surface of a nut at the inspection position;

g. a second photodetector for receiving through said slot the light reflected from said inner surface;

h. means enabled by the output of said second photodetector and responsive to the output of said first photodetec-

tor for generating a height monitoring occurrence indication; and

i. means enabled by the output of said first photodetector for generating a thread indicative occurrence indication when the output of said second photodetector exceeds a predetermined threshold level.

3,983,389

WAND FOR READING OPTICALLY ENCODED GRAPHIC SYMBOLS

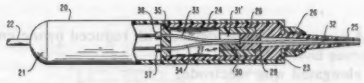
Robert L. Cowardin, Cary, and George J. Laurer, Raleigh, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 11, 1975, Ser. No. 560,765

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 3, 1976

Int. Cl.² G02B 5/14

U.S. Cl. 250—227 **11 Claims**



1. A wand suitable for scanning graphically encoded indicia and providing electric signals which are an analog of the graphically encoded indicia comprising:

first, second and third substantially cylindrical optically conductive fibers;

a first retainer including means for locating said first and second fibers with respect to a reference dimension of said first retainer such that the said first and second fibers are in contact along a line which includes common tangent points on the substantially cylindrical surfaces of the fibers and the line of contact is coincident with the said reference dimension;

a second retainer including means for locating said third fiber with respect to a reference dimension substantially identical to the first retainer such that the axis of the cylindrical third fiber is coincident with the said reference dimension;

a support for supporting said first and second retainers in juxtaposition such that the said respective reference dimensions are in alignment whereby the point of tangency of the said first and second fiber coincides with the axis of the said third fiber;

a housing for retaining said support, positioning said third fiber in a substantially elongated position, supporting a light source and a photodetector; and

means for connecting the free end of the first and second fibers to the light source and the photodetector, respectively.

3,983,390

DEVICE FOR MEASURING ANGULAR DEVIATION OF A LIGHT BEAM BY USE OF GRATINGS

Helenio Llop, Montreuil, France, assignor to Societe d'Optique, Precision Electronique et Mechanique Sopelem, Paris, France

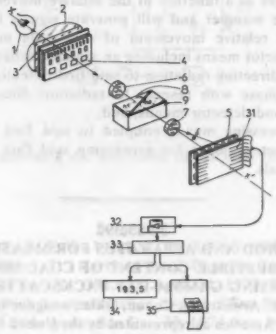
Filed June 6, 1975, Ser. No. 584,496

Claims priority, application France, June 12, 1974, 74.20285

Int. Cl.² G01D 5/34

U.S. Cl. 250—231 R **9 Claims**

1. An instrument for measurement of angular deviations comprising a luminous source for projecting a luminous beam along an optical axis, means for angularly displacing the beam with respect to the optical axis as a function of the angular deviation to be measured, a transmitting diffraction grating interposed between said source and said beam displacing means and having tracks of recurrent transparent areas for producing an image with a given transverse field, a receiving diffraction grating disposed downstream of the beam displacing means for receiving said image of the transmitting diffraction grating thereon, and means for detecting displacement of the image of the transmitting grating on the receiving grating, said image covering substantially the entire extent of the receiving grating, said gratings being centered on said optical axis and each being constituted by a plurality of engraved track arrangements, the image of each track arrangement of



the transmitting grating being projected onto a corresponding track arrangement of the receiver grating, the corresponding track arrangements having tracks with corresponding spacing, the track arrangements of each grating having stepwise successively increasing spacing between tracks, said gratings extending over the width of the field such that each track is illuminated over the entire length thereof, the width of each track being greater than the displacement corresponding to the maximum angular deviation to be measured.

3,983,391

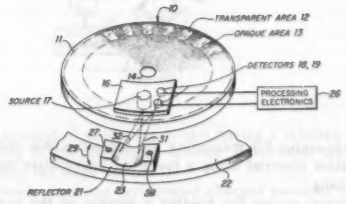
OPTICAL ENCODER OF THE REFLECTIVE TYPE

Calvin Clemons, Boston, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed May 21, 1975, Ser. No. 579,516

Int. Cl.² H01J 3/14

U.S. Cl. 250—237 G **13 Claims**



1. Encoder apparatus comprising:

A. a code member, said code member having code track means thereon, said code track means comprising a pattern of alternating radiation transmissive and radiation opaque areas; and,

B. monitoring means for monitoring relative movement of said code member, said monitoring means comprising:

a. source means supported on one side of said code member for directing radiation to said code track means;

b. detector means responsive to radiation from said source means, said detector means including at least first and second detector means for generating first and

second signals, respectively, proportional to the radiation impinging thereon;

c. reflector means supported on the opposite side of said code member from said source means for receiving radiation passing through said code track means from said source means and for reflecting at least a portion of said received radiation back through said code track means to said first and second detector means whereby said first and second detector means will each be impinged by radiation modulated by said code track means as a function of the relative movement of said code member and will generate signals indicative of said relative movement of said code member, said reflector means including an aspheric reflecting surface for directing radiation to said first detector means out of phase with respect to radiation directed to said second detector means; and,

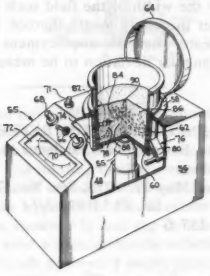
d. processing means coupled to said first and second detector means for processing said first and second signals.

3,983,392

METHOD AND APPARATUS FOR MEASURING INCOMBUSTIBLE CONTENT OF COAL MINE DUST USING GAMMA-RAY BACKSCATTER

Frederick E. Armstrong, Copan, Okla., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Feb. 14, 1975, Ser. No. 550,099
Int. Cl.² G01N *23/20*; G21K *1/00*
U.S. Cl. 250—272 **17 Claims**



1. Apparatus for measuring the incombustible content of particulate material using a radiation backscatter technique comprising

container means for holding a sample of the particulate material, said container means having first and second angularly oriented walls defining first and second angularly oriented surfaces of the sample; first and second

radiation source assembly means disposed on opposite sides of said container for producing low energy incident beams through said first wall of said container means at the first surface of the sample; and

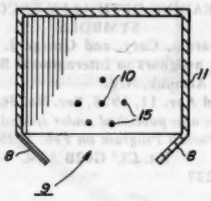
radiation detector means disposed adjacent said second wall of said container means for detecting backscattered radiation from the second surface of the sample whereby variations in scattered radiation caused by variations in density of the sample are compensated by variations in attenuation of said incident radiation beam and said backscattered radiation.

3,983,393

CORONA DEVICE WITH REDUCED OZONE EMISSION

Raghulinga R. Thettu, Webster; Phillip L. Harrison, Ontario, and John Stavisky, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed June 11, 1975, Ser. No. 585,937
Int. Cl.² H01T *19/04*
U.S. Cl. 250—326 **16 Claims**



1. A corona discharge device with reduced ozone emitting properties comprising

an elongated wire electrode,

an elongated shield, running parallel to said wire and spaced therefrom,

electrical means for applying a corona generating potential to said wire, and

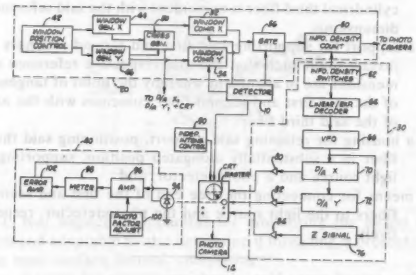
an ozone decomposing means spaced from said wire and said shield and located intermediate therebetween.

3,983,394

RADIATION CAMERA EXPOSURE CONTROL

Ronald J. Martone, Cheshire; Michael Yarsawich, East Haven, and Walter Wolczek, Trumbull, all of Conn., assignors to Picker Corporation, Cleveland, Ohio

Filed June 10, 1974, Ser. No. 477,940
Int. Cl.² G01T *1/164*
U.S. Cl. 250—363 S **32 Claims**



1. An exposure control system for use in a scintillation camera couplable to an image sensing camera and having a display apparatus responsive to radiation signals representing the position of radiation stimuli to produce and expose to the image sensing camera an image representing the positional location of the stimuli, said image being adjustable in intensity independently of said radiation signals, and a detector having a predetermined field of view and being responsive to the radiation stimuli to produce the radiation signals, said exposure control system comprising:

a. an information control circuit connected to the detector for controlling the amount of exposure of the image to the image sensing camera by terminating the exposure in response to the accumulation of a predetermined quantity of radiation occurring within a predetermined zone of said detector field,

b. a circuit connected to said information control circuit for producing an index representing the value of said quantity of radiation, said representation further being controllable as a function of said independent intensity adjustmennt of said display apparatus, and

c. a circuit for indicating the value of said index representation to enable calibration of the image intensity by varying said independent intensity adjustment in accordance with said quantity of radiation and said exposure amount to maintain the detectability of the image by the image sensing camera.

3,983,395

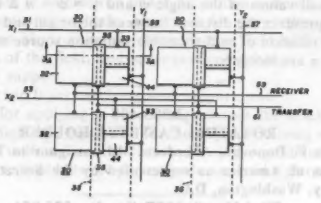
MIS STRUCTURES FOR BACKGROUND REJECTION IN INFRARED IMAGING DEVICES

James C. Kim, Liverpool, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Nov. 29, 1974, Ser. No. 528,582

Int. Cl.² G01T 1/22; H01L 27/14

U.S. Cl. 250—370 **6 Claims**



1. A CID sensing array of sensing sites, each sensing site comprising:

a. an optically sensitive receiver MIS capacitor for receiving incident radiation from a scene and storing signal and background charge corresponding to said incident radiation thereon;

b. a pair of optically insensitive MIS storage capacitors, said storage capacitors being coupled together, one of said pair being an X-storage capacitor and the other of said pair a Y-storage capacitor, and

c. an optically insensitive transfer control MIS capacitor disposed in an overlapping manner between and coupled to said receiver capacitor and to said pair of storage capacitors for controlling the transfer of charge between said receiver and storage capacitors,

d. and wherein said array is comprised of a two-dimensional array of sensing sites having rows of X-storage capacitors and columns of Y-storage capacitors.

3,983,396

APPARATUS FOR ADJUSTING THE FILAMENT CURRENT OF AN X-RAY TUBE

Jan Joseph Mattheus Mulleneers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

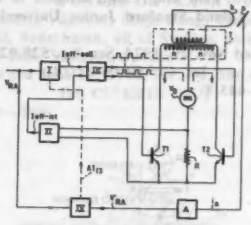
Filed Oct. 7, 1974, Ser. No. 512,916

Claims priority, application Netherlands, Oct. 12, 1973, 7314036

Int. Cl.² H05G 1/34, 1/30

U.S. Cl. 250—402 **14 Claims**

5. A filament current supply for an x-ray tube comprising, a function generator responsive to first and second control voltages related to the logarithm of the tube operating current and the logarithm of the tube operating voltage, respectively, and including means for combining said first and second control voltages to derive a first output signal indicative of the desired value of the tube filament current, means responsive to the actual filament current to derive a second output signal determined thereby, and comparison means responsive to said first and second output signals for deriving a third output



signal for controlling the amplitude of the tube filament current.

3,983,397

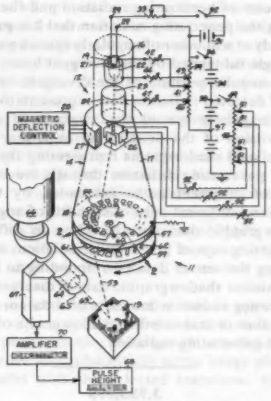
SELECTABLE WAVELENGTH X-RAY SOURCE

Richard D. Albert, 317 Hartford Road, Danville, Calif. 94523

Division of Ser. No. 353,451, April 24, 1973, Pat. No. 3,925,660, which is a continuation-in-part of Ser. No. 251,378, May 8, 1972. This application Dec. 30, 1974, Ser. No. 537,072

Int. Cl.² H05G 1/70

U.S. Cl. 250—406 **25 Claims**



1. A method of producing X-rays having a selected one of a plurality of predetermined specific wavelength spectrums comprising the steps of:

selectively directing accelerated charged particles to a selected one of a plurality of primary targets each of different composition to produce primary X-rays which include specific wavelengths characteristics of the composition of said selected primary target and also include bremsstrahlung;

directing said primary X-rays to a selected one of a plurality of secondary targets each of different composition, said secondary target being selected to emit said selected predetermined specific wavelength spectrum upon irradiation by said primary X-rays from said selected primary target; and

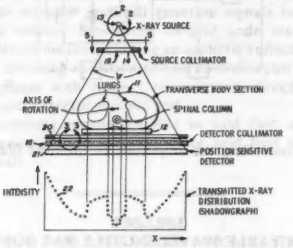
absorbing at least a substantial portion of said bremsstrahlung in at least one of said selected primary target and said selected secondary target.

3,983,398

METHOD AND APPARATUS FOR X-RAY OR γ-RAY 3-D TOMOGRAPHY USING A FAN BEAM

Douglas P. Boyd, Palo Alto, Calif., assignor to The Board of Trustees of Leland Stanford Junior University, Stanford, Calif.

Filed Nov. 29, 1974, Ser. No. 528,024
Int. Cl.² G01N 21/34
U.S. Cl. 250—445 T **20 Claims**



1. In a method of penetrating ray 3-D tomography the steps of:

directing a divergent beam of penetrating radiation through a body to be examined from a source on one side of the body to a detector on the other side of the body;

effecting relative angular displacement between the divergent beam of penetrating radiation and the body;

detecting the penetrating radiation that has passed through the body at a number of angularly spaced positions within the angle subtended by the divergent beam as a function of the angular position of the divergent beam to derive sets of detected radiation data representative of a plurality of angularly spaced shadowgrams of absorption or transmission of the penetrating radiation by the body, each of said shadowgrams representing the transmission of the penetrating radiation through the body along an array of divergent paths subtended by the divergent beam, and different ones of said sets of angularly spaced shadowgraphic data corresponding to different sets of intersecting rays of penetrating radiation; and

reordering the sets of data corresponding to absorption or transmission shadowgraphic data of divergent rays of said penetrating radiation into sets of data corresponding to absorption or transmission shadowgrams of parallel rays of said penetrating radiation.

3,983,399

TOMOGRAPHY SYSTEM HAVING AXIAL SCANNING

Jerome R. Cox, Jr., St. Louis, and Donald L. Snyder, Clayton, both of Mo., assignors to Picker Corporation, Cleveland, Ohio

Filed Mar. 18, 1975, Ser. No. 559,412
Int. Cl.² G01M 23/00
U.S. Cl. 250—445 T **14 Claims**

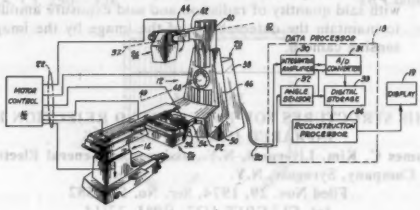
1. Apparatus for repetitiously scanning an interior section of a body with a beam of radiation through coplanar points $[r(k), \theta(n)]$ about an origin in a plane passing through the body, comprising:

a. a rotatable support assembly;

b. rotatably mounted radiation source means supported by the assembly for orbit in said plane about an area including said origin, the source being adapted to transmit a beam of radiation along said plane and through a body under examination; said beam being of relatively small cross-sectional area compared to said body,

c. radiation detector means connected to the assembly and aligned with said rotatably mounted source means for receiving said beam after it passes through such body; and,

d. data collection means, including said radiation detector means, for measuring intensity values of said beam at values of an angle ϕ of rotation and at values of an angle



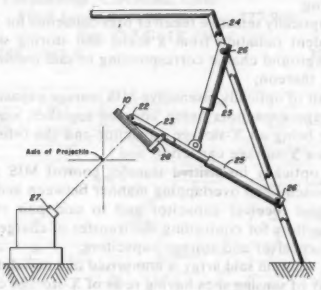
γ of orbit characterized substantially as $\phi = [(k\Delta t/d)]$ for small values of the angle ϕ and $\gamma = \phi + n\ \Delta\ \theta$, where d represents the distance between the origin and the center of rotation of said rotatable radiation source means, and k, n are integers.

3,983,400

ROTATING CASSETTE HOLDER

William F. Donovan, Aberdeen, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 8, 1975, Ser. No. 575,856
Int. Cl.² G03B 41/16
U.S. Cl. 250—468 **9 Claims**



1. An X-ray film holder to be used in the vicinity of a projectile blast for holding film in opposite spaced relation to an X-ray source, the line of sight between the X-ray source and film intersecting a projectile path, the holder comprising:

means for receiving X-ray film therein;

a structural support;

means for mounting the film receiving means to said structural support for rotation about an axis;

means interconnecting the receiving means and the structural support for holding the receiving means in a particular orientation with respect to said X-ray source and for releasing the receiving means for spinning about said axis when subjected to projectile blast forces;

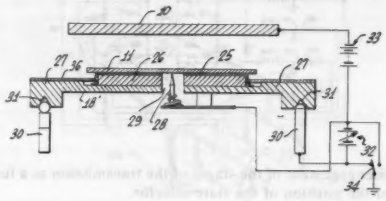
said rotatable mounting means being eccentrically mounted with respect to the centroid of the receiving means so that the receiving means responds aerodynamically to blast forces by spinning in an energy dissipating manner thereby minimizing the interval during which said spinning occurs.

3,983,401

METHOD AND APPARATUS FOR TARGET SUPPORT IN ELECTRON PROJECTION SYSTEMS

William R. Livesay, San Diego, Calif., assignor to Electron Beam Microfabrication Corporation, San Diego, Calif.

Filed Mar. 13, 1975, Ser. No. 558,073
Int. Cl.[2] H01J 37/30
U.S. Cl. 250—492 A 14 Claims



1. For use in an electron image projection system having an electron-emitting cathode, apparatus for supporting a target wafer in an electron-accelerating electric field with minimal distortion of the field, said apparatus comprising:

a wafer support;

a dielectric layer overlying said support; and

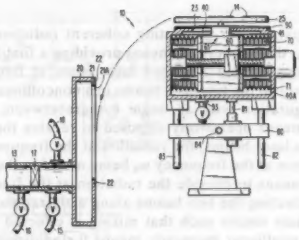
means for applying a bias voltage across the thickness of said dielectric layer, and for thereby maintaining substantially uniform and undistorted voltage gradient in the electric field between the cathode and said wafer support.

3,983,402

ION IMPLANTATION APPARATUS

Herbert Lorenz Arndt, Jr.; Demetrios Balderes, both of Wappingers Falls; John Robert Kranik, and Charles John Lucas, both of Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1975, Ser. No. 643,221
Int. Cl.[2] G01M 23/00
U.S. Cl. 250—492 A 10 Claims



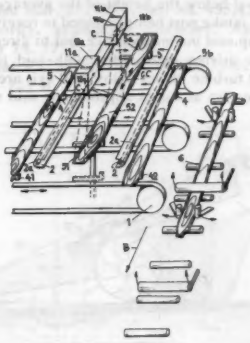
1. Ion implantation apparatus comprising in combination: a disc shaped workpiece holder and drive means to effect both reciprocation and rotation of said holder, a first chamber in which said holder is mounted for reciprocation and rotation, and a second chamber housing said drive means, said first and second chambers being in fluid communication when said apparatus is in operation; means for decreasing the pressure below atmospheric in said first and second chamber at least during rotation and reciprocation of said holder and selectively operable vent means to increase the pressure in at least said first chamber when desired; means to withdraw said workpiece holder from said first chamber and check means to inhibit a pressure increase in said second chamber upon operation of said vent means to thereby maintain a sub-atmospheric pressure in said second chamber upon withdrawal of said workpiece holder.

3,983,403

METHOD AND DEVICE FOR OPTICAL SCANNING OF A SERIES OF TRANSVERSAL DIMENSIONAL VALUES AT A BOARD OR PLANK

Claes Dahlström, Vasteras; Börje Bång, Vaxjo, and Harding Tannerstål, Soderhamn, all of Sweden, assignors to Rema Electronic Ltd., Vasteras, Sweden

Filed June 12, 1975, Ser. No. 586,403
Int. Cl.[2] G01N 21/22
U.S. Cl. 250—560 13 Claims



1. A method of optically scanning the dimensions of a plurality of selected transverse zones of a board having two sawn planar and parallel faces, at least on one side said faces being connected by an oblique wane, so that one of the said planar faces is narrower than the other, said method including the step of:

transporting the board to a scanning station and stopping it there in motionless position;

illuminating at least a first selected transverse zone of the board from each side where the board has an oblique wane by a beam of light substantially parallel with the planar faces, so that on each existing wane a maximum and on each planar face a minimum of light is reflected;

receiving the reflected light by at least one objective lens disposed at a location spaced from and opposite the narrower planar face;

forming by means of said objective lens an optical image of the light reflecting parts of the board on a rectilinear array of photosensitive pulse generators disposed behind the objective lens substantially in the image plane thereof and parallel with the selected transverse zone of the board;

transmitting the pulses generated by said generators in the array which have been activated by incident light to computer means for processing;

consecutively moving at least one of the objective lens and the array relative to the motionless board in such a way that an optical image of another selected transverse zone of the board is formed on the array; and

repeating the scanning and transmitting steps.

3,983,404

SURF-TURBINE GENERATING SYSTEM

William A. Sherrard, 25 S. Garfield St., Cleona, Pa. 17042

Filed Aug. 22, 1974, Ser. No. 499,559
Int. Cl.[2] F03B 13/10
U.S. Cl. 290—53 5 Claims

1. In a generating system for deriving electricity from the kinetic energy in ocean waves, the combination comprising:

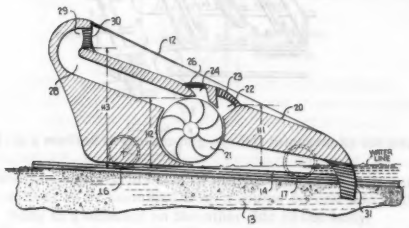
a housing adapted to be positioned in surf proximate the ocean shore;

a turbine located within said housing and including blades adapted to be rotatably driven by fluid flow about an axis extending generally parallel to the shore line;

positioning means for controllably moving said housing closer to and further from said shore, whereby to permit said turbine to be maintained entirely above the normal water level and to permit said housing to be impacted by ocean waves for substantially all tide levels;

an inclined surface of said housing directed upwardly toward said shore and positioned to be impacted by said ocean waves;

a first intake port defined through said inclined surface at a first level below the height of the average wave in said surf, said intake port being oriented to receive wave water flowing up said inclined surface and to direct wave water flow into driving relationship with said turbine blades such that turbine blades below said axis are driven in the same direction as waves approaching said shore;



a second intake port defined through said inclined surface at a level adjacent and above said first level, said second intake port being oriented to receive wave water flowing down said inclined surface from above said second level and to direct the received wave water against the turbine blades above said axis in a direction to aid the turbine drive imparted by flow through said first intake part;

a flow reversing channel having an inlet opening positioned proximate the upper end of said inclined surface to receive wave water overshooting said upper end, said inlet part being substantially higher and further downstream of the wave flow than said turbine, said channel being oriented to direct wave water received by said inlet port back down toward the turbine to impact against turbine blades above said axis in a direction which aids turbine drive imparted by flow through said first and second intake ports; and

wherein said housing includes a vent opening leading from generally below said turbine for permitting wave water used to drive said turbine to at all times drop back into the ocean beneath said housing.

3,983,405

SHIFT CONTROL SYSTEM FOR MULTI-STAGE TRANSMISSION

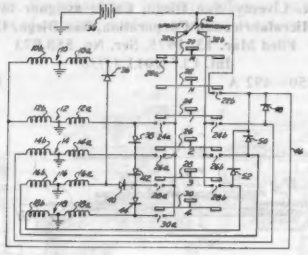
John S. Donovan, 16503 Santa Rosa, Detroit, Mich. 48221

Filed Dec. 19, 1974, Ser. No. 534,287

Int. Cl.² H01H *47/00*

U.S. Cl. 307—10 R **6 Claims**

1. In a transmission having a plurality of stages adapted to be engaged in a serial manner, a shift control system comprising: a plurality of electrically energized two-position actuators, one associated with each transmission stage, each adapted to place its associated stage in either an engaged or non-engaged position; a manually controlled state selector having a plurality of positions equal to at least the number of stages in the transmission; a source of electrical power; a plurality of switches having their conditions controlled by the state selector; a shift direction control switch and electrical conductor means interconnecting said source of electric power, said switches, said shift direction control switch, and said two-position actuators so as to control the engagement



and disengagement of the stages of the transmission as a function of the position of the state selector.

3,983,406

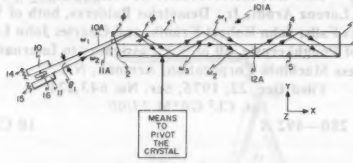
METHOD OF AND APPARATUS FOR GENERATING TUNABLE COHERENT RADIATION BY NONLINEAR LIGHT MIXING IN SYSTEMS HAVING FOLDED NONCOLLINEAR GEOMETRIES

Benjamin Lax, Chestnut Hill; Roshan L. Aggarwal, Burlington, and Neville K. S. Lee, Framingham, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed June 16, 1975, Ser. No. 587,030

Int. Cl.² H03F *7/04*

U.S. Cl. 307—88.3 **41 Claims**



38. Apparatus for generating coherent radiation at a frequency ω_3, that comprises: means providing a first laser beam at frequency ω_1 and a second laser beam at frequency ω_2; means to adjust the two laser beams in a noncollinear converging configuration with an angle θ therebetween; nonlinear medium means operatively disposed to receive the radiation of the two laser beams, the radiation at the frequency ω_1 and the radiation at the frequency ω_2 being mixed in the nonlinear medium means to provide the radiation at the frequency ω_3; means reflecting the two beams along a zig-zag path through said medium means such that mixing is effected by way of folded noncollinear geometry; means for adjusting the angle θ and for adjusting the direction of propagation of the two laser beams into the nonlinear medium means such that the conditions for mixing by folded noncollinear geometry are satisfied, that is, the electric fields of the radiation at the frequency ω_3 are added up in phase.

3,983,407

VOLTAGE-ADJUSTING ELECTRICAL PLUG

George W. Shott, Fords, N.J., assignor to Lawrence Peska Associates, Inc., New York, N.Y.

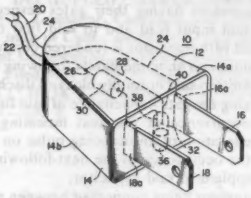
Filed July 26, 1974, Ser. No. 492,133

Int. Cl.² H02J *4/00*

U.S. Cl. 307—146 **4 Claims**

1. Means for connecting an electrical load system to a voltage source of a predetermined first voltage level for the operation of said system at optionally one of said first voltage

level and a lower second voltage level, said means comprising an electrical plug element comprising a housing member, electrical conductor prongs extending from said housing member, and electrical conductor means electrically connected at one end thereof to said load system, said conductor means comprising separate first and second conductor paths electrically connected to respectively first and second said conductor prongs, said first conductor path comprising parallel first and second circuit paths electrically connected to said



conductor prong associated with said conductor path, one of said circuit paths comprising an electrical rectifier element and another of said circuit paths comprising switching means that is open when said plug element is at a first orientation at said voltage source and closed when said plug element at a second such orientation, said switching means being vertically disposed so that said first and second orientations are 180 degrees apart with respect to the principal axis of said housing member.

3,983,408

BUCKET-BRIGADE CIRCUIT

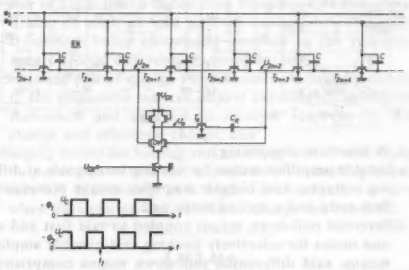
Fritz Gunter Adam, Freiburg, and Klaus Wilmsmeyer, Denzlingen, both of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Apr. 5, 1974, Ser. No. 458,153

Claims priority, application Germany, Apr. 6, 1973, 2317251; July 14, 1973, 2335988

Int. Cl.[2] G11C *19/28;* **H03K** *23/02*

U.S. Cl. 307—221 D **23 Claims**



1. A bucket brigade circuit wherein there is provided a plurality of stages which are all of the same kind, each consisting of a transistor and a capacitor coupled between the gate and drain terminal thereof, and coupled together such that the drain terminal of each transistor is connected to the source terminal of the next successive transistor, wherein the gate terminals of even-numbered transistors are controlled by a first square wave clock signal; and the gate terminals of odd-numbered transistors are controlled by a second square wave clock signal of the same frequency having effective pulses lying in the intervals between effective pulses of said first clock signal comprising:

a first differential amplifier (DV1) having first and second inputs, said first input coupled to the drain of a first transistor (T_{2n}) and said second input coupled to the drain of a second transistor (T_{2n+2}), said first and second transistors each contained in first and second alternate stages of said plurality of stages; said first differential amplifier having first and second outputs, said first output coupled to the drain terminal of one of the transistors in said bucket brigade circuit.

3,983,409

BUCKET-BRIGADE CIRCUIT

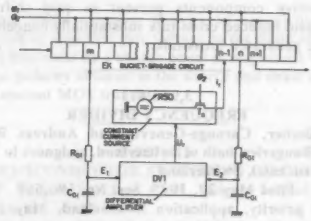
Fritz Gunter Adam, Freiburg, Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Mar. 27, 1974, Ser. No. 455,438

Claims priority, application Germany, Apr. 6, 1973, 2317252; July 14, 1973, 2335989

Int. Cl.[2] G11C *19/28;* **H03K** *23/02*

U.S. Cl. 307—221 D **14 Claims**



1. A bucket-brigade circuit wherein there is provided a plurality of stages which are all of the same kind, each consisting of a transistor and a capacitor coupled between the gate and drain terminal thereof, and coupled together such that the drain terminal of each transistor is connected to the source terminal of the next successive transistor, wherein the gate terminals of even numbered transistors are controlled by a first squarewave clock signal and the gate terminals of odd numbered transistors are controlled by a second squarewave clock signal of the same frequency having effective pulses lying in the intervals between effective pulses of said first clock signal comprising:

a differential first amplifier (DV1) havin first and second inputs, said first input coupled to the drain of a first transistor (T_m) near the input of said bucket-brigade circuit and said second input coupled to the drain terminal of a second transistor (T_n) far from the input of said bucket-brigade circuit, said first and second transistors controlled by the same clock signal, said differential amplifier having first and second outputs, said first output coupled to the drain terminal of one of the transistor preceding said second transistor for applying a compensating signal.

3,983,410

CROSS-TALK REDUCTION IN SEMICONDUCTOR MEMORY DEVICE

Anthony Donald Stalley, Camberley, England, assignor to Quantel Limited, England

Filed June 2, 1975, Ser. No. 583,145

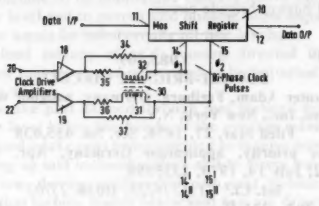
Claims priority, application United Kingdom, June 6, 1974, 25076/74

Int. Cl.[2] G11C *19/00;* **H03B** *1/00;* **H03K** *5/00*

U.S. Cl. 307—221 R **5 Claims**

1. In a memory circuit comprising a semiconductor shift register having first and second clock inputs and first and second clocking means connected with said clock inputs for effecting two phase clocking of the digital information through said shift register; the provision of apparatus comprising transformer means having a first winding connected in series with said first clocking means and said first clock input and a second winding connected in series with said second

clock input, said windings being connected in phase with each other to induce a controlled amount of cross-talk in each of said two phases in the opposite sense to cross-talk generated



by capacitive components present in said shift register whereby said induced cross-talk substantially cancels out said capacitive generated cross-talk.

3,983,411

FREQUENCY DIVIDER

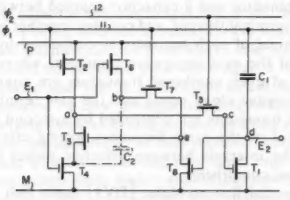
Jakob Lüscher, Carouge-Geneva, and Andreas Rusznyak, Chene-Bougeries, both of Switzerland, assignors to Ebauches S.A., Neuchatel, Switzerland

Filed May 27, 1975, Ser. No. 580,569

Claims priority, application Switzerland, May 29, 1974, 7308/74

Int. Cl.² H03K *23/30*

U.S. Cl. 307—225 C **4 Claims**



1. A binary frequency-divider stage comprising:

a plurality of field-effect transistors of one and the same conductivity type each having a pair of channel electrodes and a capacitively chargeable insulated gate, said field-effect transistors including a first, a second, a third, a fourth, a fifth, a sixth, a seventh and an eighth transistor;

a first and a second bus bar connected across a supply of direct current;

a first control lead connected to receive a train of first control pulses;

a second control lead connected to receive a train of second control pulses of the frequency of said first control pulses and oppositely phased with reference thereto;

an amplifier including said first transistor and a capacitor in series therewith, said capacitor being connected to said first control lead and forming a junction with one channel electrode of said first transistor, the other channel electrode of said first transistor being connected to said first bus bar;

an input lead for a sequence of incoming pulses of a cadence to be halved, said incoming pulses substantially coinciding with respective second control pulses;

an output lead tied to said junction;

a first charging circuit including said second and third transistors serially connected between said second bus bar and the gate of said first transistor for controlling the charging of the gate capacitance thereof, said second and third transistors having their gates respectively connected to said first and second control leads for conduction in the presence of said first and second control pulses;

a normally blocked discharge circuit including said fourth and fifth transistors serially connected between said first bus bar and the gate of said first transistor, said fourth transistor having its gate connected to said input lead for conduction in the presence of an incoming pulse; and

a second charging circuit including said sixth and seventh transistors serially connected between said second bus bar and the gate of said fifth transistor, said sixth and seventh transistors having their gates respectively connected to said input lead and to said first control lead whereby said fifth transistor is rendered conductive by an incoming pulse and an immediately following first control pulse to condition said normally blocked discharge circuit for discharging the gate capacitance of said first transistor upon the occurrence of the next incoming pulse with resulting generation of an outgoing pulse on said output lead upon the occurrence of the next-following first control pulse applied to said capacitor;

said eighth transistor being connected between said first bus bar and the gate of said fifth transistor for cutting off said fifth transistor by discharging the gate capacitance thereof upon the generation of said outgoing pulse, the gate of said eighth transistor being connected to said output lead.

3,983,412

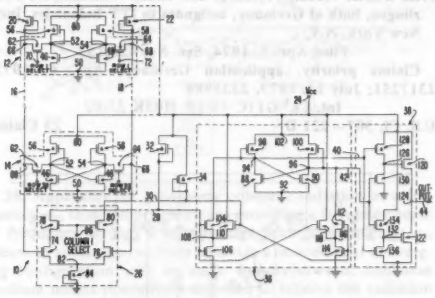
DIFFERENTIAL SENSE AMPLIFIER

Gregory Roberts, and Roger Badertscher, both of Cupertino, Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed July 2, 1975, Ser. No. 592,706

Int. Cl.² H03K *5/20, 3/286, 3/353;* **G11C** *11/40*

U.S. Cl. 307—235 F **6 Claims**



1. A structure comprising:

a bistable amplifier means for sensing two signals at differing voltages, said bistable amplifier means possessing a first node and a second node; and,

differential pull-down means coupled to said first and second nodes for selectively latching said bistable amplifier means, said differential pull-down means comprising a selected voltage supply means; and, six enhancement mode MOSFET's **1, 2,** . . . *i*, . . . **6** wherein *i* is an integer from **1** to **6** and the ith MOSFET has an ith gate electrode, an ith drain and an ith source, said first drain coupled to said first node, said second source coupled to ground, said third drain coupled to said selected supply voltage supply means;

said first source, said second drain and said third source being coupled together, said fourth drain being coupled to said second node, said fifth source coupled to ground, said sixth drain being coupled to said selected voltage supply means;

said fourth source, said fifth drain and said sixth source coupled together, said first, second and sixth gate electrodes being coupled together to form a first differential input signal terminal;

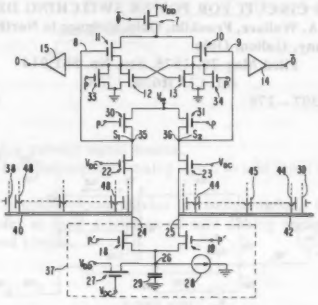
said third, fourth and fifth gate electrodes being coupled together to form a second differential input signal terminal, whereby when two signals at differing voltages are applied to said first and second terminals respectively, selective latching of said bistable amplifier means is accomplished.

3,983,413

BALANCED DIFFERENTIAL CAPACITIVELY DECOUPLED CHARGE SENSOR

Kamleshwar C. Gunsagar, Campbell, and John P. Guadagna, San Jose, both of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed May 2, 1975, Ser. No. 574,185
Int. Cl.² H03K *5/20*; **H01L** *29/78*; **G11C** *19/28*
U.S. Cl. 307—235 F **8 Claims**



1. A balanced differential capacitively decoupled charge sensor for detecting small amounts of charge, comprising:

balanced differential sensing means adapted to receive charge representing data and charge representing a reference value, said differential sensing means comparing said data charge and said reference charge to determine the logic state represented by said charge representing data;

a pair of capacitance decoupling transistors, the respective drains of each of said pair of capacitance decoupling transistors being electrically coupled to the respective inputs of said differential sensing means;

a matched pair of charge output nodes electrically coupled to the respective sources of said capacitance decoupling transistors and adapted to receive, respectively, data charge and reference charge; and

charging means for biasing and resetting both of said charge output nodes so that said capacitance decoupling transistors are functioning in a high transconductance mode when data charge and reference charge are received.

3,983,414

CHARGE CANCELLING STRUCTURE AND METHOD FOR INTEGRATED CIRCUITS

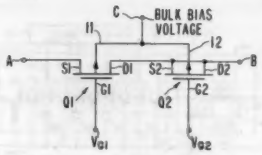
Kenneth R. Stafford, and John P. Guadagna, both of San Jose, Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Feb. 10, 1975, Ser. No. 548,302
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976
Int. Cl.² H03K *17/16*, *17/60*
U.S. Cl. 307—251 **3 Claims**

3. The method of operating a transistor switching circuit comprising a first MOS switching transistor and a second MOS charge cancelling transistor wherein said second MOS charge cancelling transistor possesses a source and drain region each connected to the drain of said first MOS switching transistor, comprising the steps of:

1. applying a first gate voltage to the gate of said first MOS transistor; and

2. simultaneously applying a second gate voltage, the complement of said first gate voltage, to the gate of said



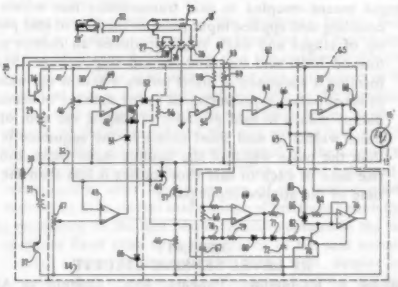
second MOS transistor thereby to cancel any charge induced by said first gate voltage in the drain of said first MOS transistor by a charge equal in magnitude but opposite in polarity induced in the source and drain regions of said second MOS transistor.

3,983,415

SEMICONDUCTOR SWITCHING CIRCUIT

Herbert F. Nichols, San Jose, Calif., assignor to Joel Bauman, San Francisco, Calif.

Division of Ser. No. 295,448, Oct. 6, 1972, Pat. No. 3,851,528.
This application July 29, 1974, Ser. No. 492,688
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976
Int. Cl.² H03K *17/60*; **G05F** *3/00*
U.S. Cl. 307—255 **2 Claims**



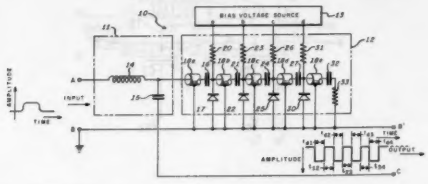
1. A semiconductor switching circuit for simultaneously connecting the separate terminals of two dc potentials respectively of positive and negative polarity to a load with a single pole of a switch comprising a load; a terminal providing negative potential; a terminal providing positive potential; a pair of transistors, one of which is a PNP transistor having its emitter connected to said terminal providing positive potential and its collector connected to said load, and the other of which is a NPN transistor having its emitter connected to said terminal providing negative potential and its collector connected to said load; a resistance; and a single pole of a switch, the bases of said transistors being connected to one another through said resistance and said single pole of a switch whereby the closing of said switch results in simultaneous current flow through said bases to turn said transistors on simultaneously for the simultaneous application of both of said potentionals to said load.

3,983,416

SHORT PULSE SEQUENTIAL WAVEFORM GENERATOR

Harry M. Cronson, Lexington, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 30, 1974, Ser. No. 537,237
Int. Cl.² H03K 4/00, 3/33
U.S. Cl. 307—260 9 Claims



1. An apparatus for providing a sequence of short pulses in response to an applied input pulse of a predetermined pulse width and a predetermined rise time, said apparatus comprising

transmission line means for dispersionless propagation including a plurality of sections and a terminating section,

a plurality of stages each including a section of said transmission line means and semiconductor means connected in shunt across said section of said transmission line means wherein each of said semiconductor means stores charge therein when forward biased and produces a first step voltage in response to an incident step voltage and produces a second step voltage when said stored charge is depleted,

bias voltage means coupled to each of said semiconductor means for providing forward bias voltage to each of said semiconductor means,

impedance means coupled to said terminating section of said transmission line means, and

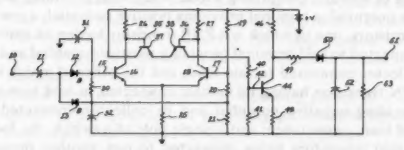
input means coupled to said transmission line means for coupling said applied input pulse to the first of said plurality of stages and each stage produces an output pulse formed from said first and second step voltage thereby forming a sequence of short pulses wherein the number of short pulses is proportional to the number of semiconductor means in said plurality of stages, the sum of the pulse widths of said short pulses in the sequence is less than the pulse width of the applied input pulse and the rise time of each of said short pulses is less than the rise time of the applied input pulse.

3,983,417

RF LEVEL SENSING CIRCUIT

William A. Rheinfelder, Phoenix, Ariz., assignor to Alpha Engineering Corporation, Phoenix, Ariz.

Continuation-in-part of Ser. No. 553,924, Feb. 28, 1975. This application Apr. 17, 1975, Ser. No. 569,107
Int. Cl.² H03K 5/00, 1/14
U.S. Cl. 307—261 6 Claims



1. An rf level sensing circuit comprising:

a. an input terminal and an output terminal;

b. a back diode having one side thereof connected to said input terminal;

c. a voltage supply source;

d. a differential amplifier having a pair of inputs and an output and including a pair of transistors, each having their emitter-collector circuits connected in parallel, the base of each transistor forming one of said inputs, the base of one of said transistors connected to said input terminal;

e. a voltage divider comprising first, second and third resistors connected in series across said voltage supply source;

f. means connecting the other side of said diode to the junction of said second and third resistors;

g. means connecting the base of the other of said transistors to the junction of said first and second resistors; and

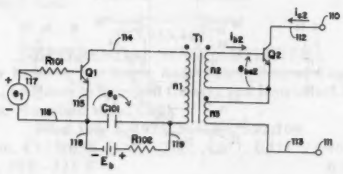
h. means connecting the output of said differential amplifier to said output terminal.

3,983,418

DRIVE CIRCUIT FOR POWER SWITCHING DEVICE

Kenneth A. Wallace, Franklin, Ohio, assignor to North Electric Company, Galion, Ohio

Filed May 29, 1975, Ser. No. 581,914
Int. Cl.² H03K 17/00
U.S. Cl. 307—270 4 Claims



1. In a drive circuit for a power switching device, said device having a control electrode and first and second output electrodes, means for controlling the conduction state of said device comprising;

transformer means including a primary winding, a first transformer secondary winding connected between said control electrode and said first output electrode, a second transformer secondary winding connected between said first output electrode and a path for carrying current flowing between said first and second electrodes, said first and second windings mutually poled to provide regenerative coupling therebetween,

control switch means having a first switching state and a second switching state, and biasing means connected in series with said control switch means across said primary winding of said transformer means,

said control switch means operative, in said first switching state, to enable said biasing means to initiate, via said transformer means, turn-off of said power switching device, to provide a reverse bias to said control electrode, and to reset the transformer core flux operating point, and said control switch means further operative, in said second switching state, to render, via said transformer means, said power switching device conductive by substantially isolating said biasing means from said primary winding.

3,983,419

ANALOG WAVEFORM TRANSDUCING CIRCUIT

Frank F. Fang, Yorktown Heights, N.Y., assignor to International Business Machines - IBM, Yorktown Heights, N.Y.

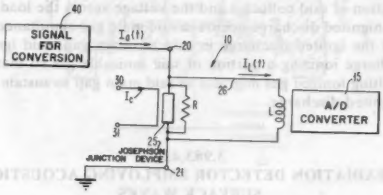
Filed Dec. 31, 1974, Ser. No. 537,803
Int. Cl.² H03K 3/38; G11C 27/02; G08C 9/00
U.S. Cl. 307—277 22 Claims

1. An analog waveform transducing circuit including at least a pair of circuits responsive to an analog signal input in the

form of a current for transferring at least a predetermined portion of said input current to said second circuit comprising:

a first superconducting circuit including a Josephson device connected between input and output terminals,

a second superconductive circuit connected in parallel with said first circuit and having an inductance greater than that of said first circuit,



an analog current signal source,

means for applying said analog signal to said input terminal, and

means coupled to said device for switching said device to transfer at least a portion of said analog signal to said second circuit.

3,983,420

SIGNAL GENERATOR CIRCUIT

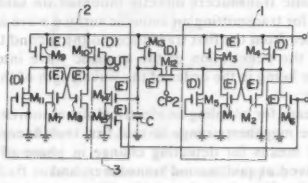
Tadao Kikuchi, Hinode, Japan, assignor to Hitachi, Ltd., Japan

Filed Aug. 28, 1975, Ser. No. 608,736

Claims priority, application Japan, Sept. 4, 1974, 49-100926

Int. Cl.² H03K 3/26

U.S. Cl. 307—279 **7 Claims**



1. A signal generator circuit characterized by comprising at least first and second flip-flops which are first stabilized to one value when a power supply is energized, memory means, a logical product circuit, and first and second pulse signals which arrive periodically and which differ in phase, said first pulse signal being applied to an inversion input terminal of said first flip-flop, an inversion output signal of this flip-flop being stored in synchronism with said second pulse signal by said memory means provided at one input of said logical product circuit, said first pulse signal being applied to the other input of said logical product circuit, an output thereof being applied to an inversion input terminal of said second flip-flop, an inversion output signal of said second flip-flop being made an output signal.

3,983,421

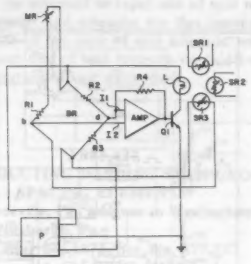
REMOTE AUDIO ATTENUATOR

Mario G. Yogore, Rosemead, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Jan. 24, 1975, Ser. No. 543,819

Int. Cl.² H03K 3/42

U.S. Cl. 307—311 **2 Claims**



1. An electronic control circuit for the remote regulation of a first photo-resistor which is otherwise electrically isolated from the said control circuit, said control circuit fitted with feed back means to compensate for drift of the said first photo-resistor, comprising

an electronic control circuit incorporating an amplifier, the input of which is regulated by a resistance bridge, and the output of which is connected to a light source in the form of an electric light,

said resistance bridge fitted with a variable control resistor in a first arm of the bridge and a second photo-resistor in a second arm of the bridge,

said first and second photo-resistors being of matched characteristics and physically located to be illuminated by the said electric light,

said first and second arms of the resistance bridge being joined to resistors connected as the third and fourth arms of the resistance bridge such that the output of the connected amplifier is constant when the resistance of the said first arm is in a constant fixed ratio to the resistance of the said second arm of the resistance bridge, with

a change of the resistance of the said second arm causing the amplifier to vary its output signal to the connected electric light to alter the illumination of said light and to consequently alter the resistance of the second photo-resistor so as to cancel said change of resistance such that

the resistance of the first photo-resistor remains in the said constant fixed ratio to the resistance of the said variable control resistor of the said first bridge arm, despite any common drift of resistance value in each of the matched photo-resistors with respect to a constant output of light from the electric light.

3,983,422

DETECTOR HAVING A CONSTANT FALSE ALARM RATE

Alexander M. Nicolson, Concord, and Richard M. Mara, Tewksbury, both of Mass., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 16, 1975, Ser. No. 568,644

Int. Cl.² H03K 1/12

U.S. Cl. 307—322 **12 Claims**

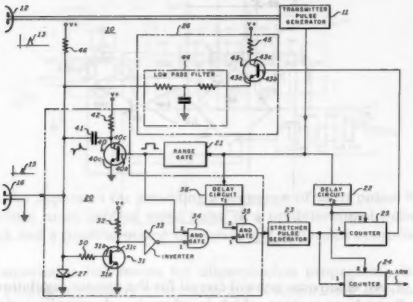
1. In a constant false alarm rate detector for use with a signal source which provides input signals at known repetition rates within a useful frequency band to said detector in an environment where noise is present, said detector including a range gate generator, a long time constant feedback circuit and an improved variable threshold means comprising

bistable circuit means having a first terminal coupled to an output terminal of said long time constant feedback cir-

cuit, a variable threshold, and first and second stable states for switching from said first stable state to said second stable state in response to noise or input signals of an amplitude greater than the instantaneous value of the variable threshold,

control circuit means coupled between said range gate generator and said first terminal of the bistable circuit means for setting the bistable circuit means to said first stable state and for regulating the period of time during which the detector is sensitive, and

logic circuit means coupled to said control circuit means, said first terminal of said bistable circuit means and an input terminal of said long time constant feedback circuit for providing an output signal in response to the bistable circuit means switching from said first stable state to said second stable state during the period of time said detector is sensitive.



3,983,423

THERMIONIC CONVERTER

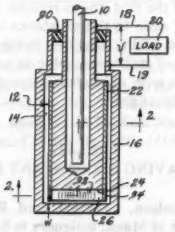
Ned S. Rasor, Sunnyvale, and Edward J. Britt, Cupertino, both of Calif., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Jan. 9, 1975, Ser. No. 539,746

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.[2] H01J *45/00*

U.S. Cl. 310—4 R 7 Claims



1. A gas-filled thermionic converter for generating a current through a load in response to heat applied to the converter from a heat source, comprising, a collector, an emitter coupled to said collector by the load and having a main emitter surface region so positioned with respect to said collector to form a main gap therebetween and having an auxiliary emitter surface region in direct electrical and thermal contact with said main emitter region so that said regions are at about the same temperature, said auxiliary emitter region being so positioned with respect to said collector to form an auxiliary gap therebetween partially isolated from said main gap with access allowed therebetween, and an ionizable gas within said auxiliary gap and said main gap capable of migrating therebetween, with sufficient heat from the heat source applied to said emitter to cause the emission of electrons therefrom, the work function of said auxiliary emitter region being of such value with respect to the sum of the work function of said collector and the voltage across the load that an ignited discharge occurs between the auxiliary emitter and collector in said auxiliary region and the work function of said main emitter region being of sufficient value with respect to the sum of the work function of said collector and the voltage across the load that an unignited discharge occurs in said main gap simultaneously with the ignited discharge in said auxiliary gap, said ignited discharge ionizing a portion of said ionizable gas so that the resulting ionized gas migrates to said main gap to sustain said unignited discharge.

3,983,424

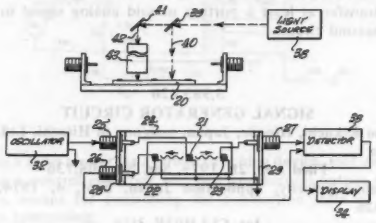
RADIATION DETECTOR EMPLOYING ACOUSTIC SURFACE WAVES

Joel H. Parks, Los Angeles, Calif., assignor to The University of Southern California, Los Angeles, Calif.

Filed Oct. 3, 1973, Ser. No. 403,096

Int. Cl.[2] G01K *11/22*; H01L *41/10*

U.S. Cl. 310—8.1 12 Claims



1. In a radiation detector, the combination of:

an acoustic surface wave transmission line including a substrate with a first surface and having first and second acoustic transducers directly mounted on said first surface for transmitting an acoustic surface wave at said first surface from the first transducer to the second transducer with the penetration of the acoustic wave into the substrate being in the order of the wavelength of the acoustic wave;

first means for coupling an electrical signal source operating in the megahertz range to said first transducer;

second means for detecting change in phase of the wave received at said second transducer; and

means for directing a beam of radiation onto said first surface between said transducers, with the phase change at the surface of said substrate between said transducers being a function of the temperature change at said first surface resulting from incident radiation at said first surface.

3,983,425

TUNED PLATE ACOUSTIC PROJECTOR WITH PIEZOELECTRIC DRIVER

Michael L. Barlow, Silverdale, Wash., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

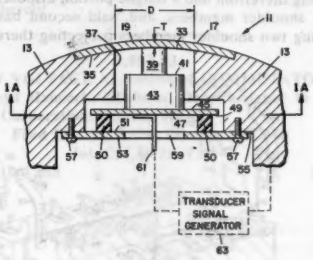
Filed Sept. 15, 1975, Ser. No. 613,715

Int. Cl.[2] H01L *41/08*

U.S. Cl. 310—8.7 8 Claims

1. An acoustic projector comprising:

a. a plate having a lower surface an an upper surface;
b. said plate having the periphery supported by a structure and an unsupported central section;
c. said upper surface being exposed to an acoustic transmitting medium;



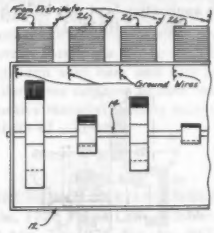
d. motion generating means for imparting an upward motion to the lower surface of the unsupported central section of said plate;
e. said plate having a predetermined thickness; whereby
f. said thickness is selected such that the ourwardly radiating velocity of the flexural waves imparted by said means is about equal to the velocity of sound of said medium.

3,983,426

METHOD AND MEANS OF UTILIZING MAGNETISM TO ACHIEVE ROTATION OF A DRIVE SHAFT

Charles L. Kilmer, 2221-23 Jones St., Omaha, Nebr. 68102

Filed Apr. 28, 1975, Ser. No. 571,999
Int. Cl.[2] H02K *37/00*
U.S. Cl. 310—46 **4 Claims**



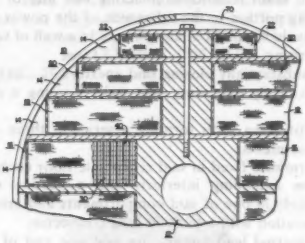
1. A device of the class described, comprising,
a support means,
a drive shaft rotatably mounted on said support means,
a plurality of magnet supports secured to said drive shaft in a spaced-apart and staggered relationship,
each of said supports having a plurality of radially spaced permanent magnets operatively secured thereto,
each of said magnets having a positive pole on one side thereof and a negative pole on the other side thereof, the magnetic north-south polar axis of each magnet aligned substantially radially to said drive shaft axis,
a plurality of air-core solenoids mounted on said support means in a spaced-apart relationship and being positioned relative to said supports whereby the permanent magnets on one of said supports will rotate past one of said solenoids in close proximity thereto, said solenoids being disposed longitudinally with respect to the longitudinal axis of said shaft,
said staggered relationship of said supports causing the permanent magnets on supports to be radially offset with respect to each other,
a distributor means operatively mechanically connected to said drive shaft whereby rotation of said drive shaft will cause said distributor means to be actuated,
means electrically connecting said distributor means to a source of electrical energy,
and means electrically connecting said distributor means with said solenoids whereby the actuation of one of said solenoids will cause the flux emanating from one side of the core of the solenoid to repel one of said magnets on said one support and whereby the flux emanating from the other side of the core of said solenoid will simultaneously attract one of said magnets on said one support to impart rotation to said drive shaft.

3,983,427

SUPERCONDUCTING WINDING WITH GROOVED SPACING ELEMENTS

Asim Ulke, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 14, 1975, Ser. No. 577,517
Int. Cl.[2] H02K *1/32*
U.S. Cl. 310—61 **12 Claims**

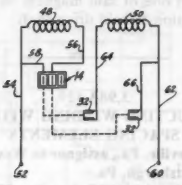


1. In combination,
a rotor member of a dynamoelectric machine, said rotor member including a core having slots in which a number of conductor turns are convolutely wound to form a plurality of coils, said coils being electrically connected one to another to constitute a rotor winding, each of said coils having a plurality of conductor layers; and,
a spacing element disposed between adjacent conductor layers in each coil and extending therethrough in a convolute relation therewith, said spacing element comprising:
rib portions which engage and space apart confronting surfaces of conductor turns of adjacent conductor layers; and,
non-contacting rib portions disposed intermediate said contacting rib portions which in combination with said contacting rib portions and the confronting surfaces of said conductors define a plurality of channels to permit passage of a cooling fluid through said coils, said channels being separated one from another by said non-contacting rib portions, each said channel providing a continuous, discrete flow path through said channel and having an inlet port to receive the cooling fluid and an outlet port to discharge the cooling fluid after it has passed through said coil.

3,983,428
INTERCHANGEABLE CONNECTOR MEANS FOR ELECTRIC MOTOR OPERATION ON EITHER OF TWO SUPPLY VOLTAGES

Richard C. Bitsch, and Lawrence E. McCrary, both of St. Louis, Mo., assignors to Emerson Electrical Co., St. Louis, Mo.

Filed June 10, 1974, Ser. No. 477,686
Int. Cl.² H02K *11/00*
U.S. Cl. 310—71 **1 Claim**



1. In an electric motor having a casing and a stator winding therein,

means for interchangeably connecting two portions of said winding in parallel or in series across a power source comprising;

a first main lead for connecting one end of a first winding portion to one side of a power source, and

a second main lead for connecting one end of a second winding portion to the other side of the power source,

a receptacle mounted in an aperture in a wall of said casing comprising;

a floor substantially closing said aperture,

four outwardly extending side walls forming a rectangle, and

two partitioning walls forming a series of three open end compartments,

three terminals fixed in said receptacle floor each having a portion extending interiorly and a portion extending exteriorly in one of said compartments and arranged for cooperation with a push-fit lead connector,

a first internal lead connecting said one end of said first winding portion to said interiorly extending portion of a first terminal, and

a second internal lead connecting the other end of said first winding portion to said interiorly extending portion of a second terminal,

first and second internally and externally extending leads connected at their internal ends to the opposite ends of said second winding portion and each having a push-fit connector at their exterior end for engagement with said exterior extending portion of said terminals,

a cover member comprising four side walls forming a rectangle arranged for push-fit assembly over said receptacle side walls in either of two end-for-end positions, and said cover member having a bottom wall portion enclosing one end compartment of the series when assembled in said one position and enclosing the other end compartment when assembled in said other position.

3,983,429
ADJUSTABLE MOTOR BASE

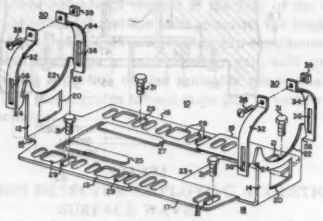
William D. Allardice, Jr., Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 8, 1975, Ser. No. 575,889
Int. Cl.² H02K *5/00*
U.S. Cl. 310—91 **7 Claims**

1. In combination, a dynamoelectric machine and a mounting base therefore, said dynamoelectric machine including an axially projecting end bell having first and second hub mounting portions;

said mounting base including first and second interlocking base portions slidably engaged one with another to permit expansion and contraction of the axial length of said mounting base, and a yoke carried by one of said interlocking base portions;

said first base portion having two shoulder members projecting therefrom and a tongue portion disposed between said shoulder members; and, said second base portion having two shoulder members projecting therefrom and



two channel members disposed between said shoulder members, said shoulder members of said first and second base portions being arranged in an overlapping relationship and said tongue portion being engaged in sliding contact with said channel members;

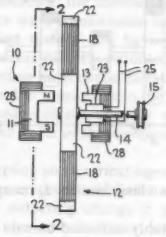
the axial length of said mounting base being adjustable to permit alignment of said yoke with a selected one of said hub mounting portions; and,

means securing said yoke to said selected one of said hub mounting portions.

3,983,430
ELECTRIC GENERATOR

Gerald T. Howard, Rte. 7, Box 606, Augusta, Ga. 30906

Continuation-in-part of Ser. No. 463,484, April 24, 1974, abandoned. This application Sept. 11, 1975, Ser. No. 612,322
Int. Cl.² H02K *21/38*
U.S. Cl. 310—155 **4 Claims**



1. An electric generator comprising:

at least one stationary magnet and at least one stationary core of non-permanent magnetic material provided with induction field coil windings and disposed in alignment with said magnet with poles facing one another,

a magnetic flux field suppressor movably mounted between said magnet and said core, said suppressor comprising a rotary circular disc having first portions forming alternate sectors of stacked non-permanent magnetic sheets interleaved with thin layers of non-magnetic material,

the remaining portions of said disc being sectors of non-magnetic material, said sectors being in alignment with said facing poles,

means rotating said disc so that, upon rotation of said disc, the magnetic flux lines passing between said aligned magnet and core pass through said remaining portions and

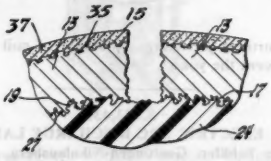
through said core and back to said magnet and are redirected and focused by said first portions as said flux lines pass along said sheets to thereby alternately induce and electric voltage and current in said coil as the flux field of said magnet is alternately allowed to pass through said core via said remaining portions of said disc during rotation thereof.

3,983,431

LOW VOLTAGE ALUMINUM COMMUTATORS

James Lloyd Hancock, Fairborn, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 23, 1974, Ser. No. 535,348
Int. Cl.² H02K *13/04*
U.S. Cl. 310—233 2 Claims



1. A wear resistant commutator particularly suitable in electrical machinery applications where the applied or produced voltage is as low as 3 volts, said commutator comprising:

a. a molded resinous electrically nonconductive spool; and

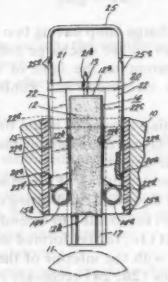
b. a plurality of etched and electrically conductive aluminum alloy bars, each electrically insulated from all others, uniformly spaced around and securely bonded to the periphery of said spool, the etched surfaces of said bars having thereon a tenacious and conductive oxide layer having a thickness in the range of from about 500 to about 1,500 angstroms, wherein the surface of said layer is characterized by many small irregular cavities which on the inner surfaces of said bars contain the resinous spool material thereby forming a strong interlocking mechanical bond between said bars and said spool and which cavities on the outer surfaces of said bars are filled with a soft conductive material thereby increasing the electrical conductivity of said bars.

3,983,432

BRUSH HOLDER ASSEMBLY

Alexander Rankin, 1720 Penns Lane, Ambler, Pa. 19002

Filed Apr. 22, 1975, Ser. No. 567,720
Int. Cl.² H02K *13/00*
U.S. Cl. 310—242 9 Claims



1. In an electric maching having a housing, an armature rotatable in said housing, at least one brush engaging the armature, and spring means urging said brush into engagement with said armature, the improvement comprising:

guideway means in said housing providing an access opening to said armature from outside said housing,

a brush and spring holder received in said guideway means and being displaceable inwardly toward and outwardly away from said armature,

releasably engaging latching surfaces on said guideway means and said holder,

resilient means mounting at least one of said latching surfaces for movement laterally out of engagement with the other, and

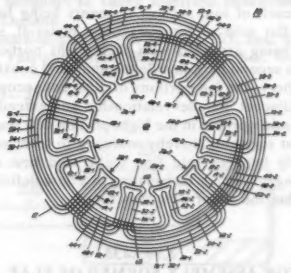
means providing a camming surface on said resilient means for cooperating with said guideway means to define therebetween an inwardly and laterally narrowing space adapted to receive an operator displaceable axially inward from outside said housing, said camming surface being shaped to deflect said resilient means laterally for effecting disengagement of said latching surfaces upon said inward displacement of said operator, whereby the brush holder can be withdrawn out of the guideway means.

3,983,433

WIRE STATOR CORE STRUCTURE AND METHOD OF MAKING SAME

Marion W. Sims, South Whitley, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed Nov. 5, 1974, Ser. No. 521,045
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976
Int. Cl.² H02K *1/06, 1/12*
U.S. Cl. 310—254 18 Claims



1. A stator core structure for a dynamo-electric machine comprising a filament of ferro-magnetic material generally spirally disposed in at least one generally planar layer and including a plurality of spaced apart teeth in the layer each respectively constituted by a plurality of generally contiguous open loop portions of the filament, one of the loop portions in each of the teeth having an end defining at least in part a bore in the stator core structure, and a plurality of connecting portions of the filament respectively joined between the loop portions.

3,983,434

SEGMENTED STATOR CORE STRUCTURE AND METHOD FOR MAKING SAME

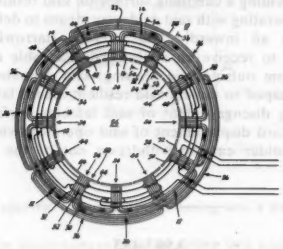
Marion W. Sims, South Whitley, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed Nov. 5, 1974, Ser. No. 521,046

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.[2] H02K *1/12*

U.S. Cl. 310—254 16 Claims



1. A stator core structure for a dynamoelectric machine comprising a first plurality of generally U-shaped segments each having a bight portion and a pair of leg portions, each of said first segments being formed of at least one flat strip of ferro-magnetic material, the bight portions of each of said first segments having an opening formed therethrough intermediate its leg portions, said first segments being arranged with said bight portions thereof forming a first periphery and with said leg portions thereof extending radially, the leg portions of adjacent first segments being in adjacent, parallel relationship mutually to form first teeth, and at least a second plurality of generally U-shaped segments equal in number to said first segments and each having a bight portion and a pair of leg portions, each of said second segments being formed of at least one flat strip of ferro-magnetic material, said second segments being arranged with their bight portions forming generally a second periphery larger than and coaxial with said first periphery, the leg portions of adjacent second segments being in adjacent, parallel relationship and extending radially through a said opening in the bight portion of a respective one of said first segments thereby mutually to form second teeth respectively between said first teeth, said first and second teeth having inner ends terminating in a bore defining configuration within the stator core structure.

3,983,435

STATOR ASSEMBLY FORMED OF FLAT, STRIP MATERIAL

Marion W. Sims, South Whitley, Ind., assignor to General Electric Company, Fort Wayne, Ind.

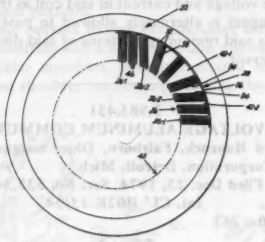
Filed Nov. 5, 1974, Ser. No. 521,044

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.[2] H02K *1/06, 1/12*

U.S. Cl. 310—259 9 Claims

1. A stator assembly for a dynamoelectric machine comprising a yoke member formed of a continuous strip of ferro-magnetic material and having an inner surface facing toward a bore; a plurality of spaced teeth extending generally axially along and inwardly from the inner surface and having inner ends defining the bore, each of the teeth having a plurality of generally axially and inwardly extending ferro-magnetic flat segments; and connecting portions respectively positioned between adjacent ones of the teeth, each of the connecting portions including a pair of leg elements respectively forming parts of the adjacent teeth, and a bight portion between the leg elements and disposed adjacent the bore; the teeth and connecting portions providing a plurality of coil winding slots open adjacent the yoke.



3,983,436

ELECTRIC ARC DISCHARGE LAMP

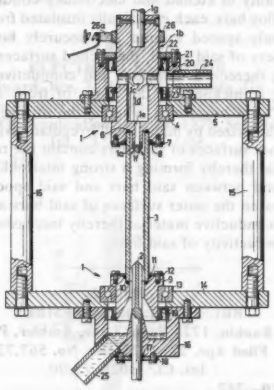
Fritz Peter Schäfer, Goettingen-Nikolausberg, Germany, assignor to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Goettingen, Germany

Filed Dec. 4, 1975, Ser. No. 637,651

Claims priority, application Germany, Dec. 19, 1974, 2460277

Int. Cl.[2] H01J *61/52*

U.S. Cl. 313—35 10 Claims



1. Electric arc discharge lamp having two electrodes (1*a*, 2) defining therebetween an arc discharge path;

a tube (3) transparent to the light of the arc discharge surrounding the electrodes and confining the arc discharge therein;

and means generating a layer of liquid on the inner wall of the tube, which layer rotates about the axis of the tube, said lamp further comprising

a rotatable tube holder fitting (1) holding the tube sealed therein to rotate therewith, said fitting carrying a first one of the electrodes (1*a*) located to extend into the tube (3);

a liquid supply duct (1*c*, 1*d*, 1*e*) formed in the fitting in fluid communication with the interior of the tube (3);

liquid supply means (20, 24) relatively rotatable and sealingly located adjacent the rotatable fitting and in fluid communication with the liquid supply duct;

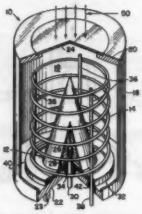
and a rotatable drain fitting (9–12) secured to the other end of the tube formed with drain ducts to drain liquid from the tube.

3,983,437

ELECTROMAGNETIC RADIATION DETECTOR

Jay L. Benson, and Gordon J. Hansen, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Mar. 12, 1968, Ser. No. 713,279
Int. Cl.[2] H02K 7/10
U.S. Cl. 313—99 9 Claims



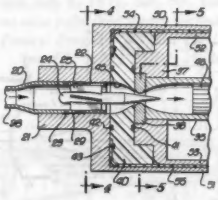
1. An electromagnetic radiation detector having a central axis and a radiation entrance end, comprising a cathode member having an exterior photoelectric emissive surface disposed at an acute angle to said central axis, anode means separated from and cylindrically disposed about said cathode member for collecting primary electrons emitted from said emissive cathode surface, high transmissive grid means disposed between said cathode member and said collecting means for blocking secondary electrons emitted from said emissive cathode surface with said primary electrons.

3,983,438

SPARK GAP SWITCH

Jeffrey I. Levatter, Palo Alto; Shao-Chi Lin, La Jolla, and Paul B. Scott, Topanga, all of Calif., assignors to Xonics, Inc., Van Nuys, Calif.

Filed Aug. 21, 1975, Ser. No. 606,519
Int. Cl.[2] H01T 3/00
U.S. Cl. 313—146 16 Claims



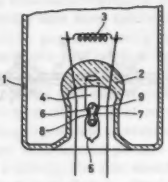
1. In a spark gap switch, the combination of:
a first central electrode;
a second annular electrode;
a first fluid line;
a second fluid line;
a first electrical conducting frame, with said first electrode and fluid line mounted therein for fluid flow through said line about said electrode;
a second electrical conducting frame, with said second electrode and fluid line mounted therein for fluid flow through said line and electrode;
an electrical insulator;
means for mounting said insulator between said first and second frames in fluid sealing relation, with said first electrode positioned within said second electrode, and with said insulator defining a fluid flow path between said lines; and
means for connecting a voltage across said electrodes.

3,983,439

MERCURY VAPOR DISCHARGE LAMP WITH MERCURY CONTAINER IN ENVELOPE EXHAUST TUBE

Cornelis Wilhelmus Adrianus Blommerde; Johannes Antonius Maria Ridders, both of Eindhoven, and Hulbegt Westerbeke, Middelburg, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 20, 1975, Ser. No. 560,166
Claims priority, application Netherlands, Feb. 12, 1975, 7501631
Int. Cl.[2] H01J 61/20, 61/28, 61/30
U.S. Cl. 313—174 6 Claims



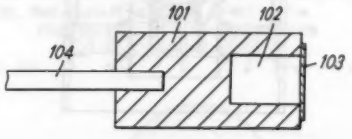
1. A mercury vapour discharge lamp which comprises a lamp envelope and an exhaust tube in fluid communication with the interior of said envelope, said exhaust tube including a closed metal container in which a quantity of mercury in a metallic form is disposed in a reservoir section, said container being at least plate-shaped for a portion thereof and dimensioned and configured to allow fluid flow within said tube, said container having a constriction at one axial location, and said exhaust tube having a constriction at one axial location, said constrictions cooperating to constrain movement of said container with respect to said exhaust tube.

3,983,440

DISCHARGE LAMP COMPONENT

Kenneth Scott, and Arthur Samuel Vause, both of London, England, assignors to Thorn Electrical Industries Limited, London, England

Continuation-in-part of Ser. No. 321,797, Jan. 8, 1973, abandoned. This application May 23, 1975, Ser. No. 580,283
Int. Cl.[2] H01J 61/06
U.S. Cl. 313—217 15 Claims



1. In an electric discharge lamp comprising a discharge envelope, electrodes disposed therein for establishment of said discharge, a fill of gas therein, and at least one arc-modifying substance selected from halogens, metals and metal halides, the improvement which comprises a structure mounted within the discharge envelope and including: a refractory metal body formed with a cavity therein; a source of said arc-modifying substance contained in said cavity; and a cover closing said cavity and serving to protect said source from the environmental atmosphere; said source and structure being capable of releasing such substance into said discharge envelope upon subsequent treatment.

14. A method of making an electrical discharge lamp comprising the steps of: fabricating a refractory body containing a cavity; introducing into said cavity a source of arc-modifying material; enclosing said material within said cavity by a cover

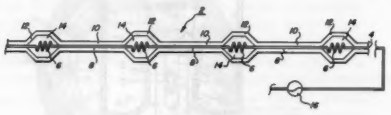
comprising a metal closure; fitting the resulting component in a discharge lamp envelope together with other necessary electrodes and components; sealing said envelope; exhausting and gas-filling said envelope; and fusing said metal closure to release said material.

3,983,441

MULTIPLE PINCH INCANDESCENT LAMP

Karl A. Northrup, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed July 3, 1975, Ser. No. 592,840
Int. Cl.² H01K 1/28, 3/02
U.S. Cl. 313—222 4 Claims



1. An incandescent filament lamp including:

a filament operatively connected to a source of electrical energy, said filament including a series of alternate active coil sections and inactive straight sections,

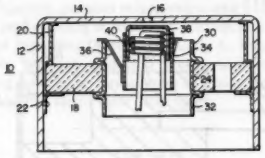
an envelope disposed around said filament along its length, said envelope being drawn down around said filament along said straight sections thereof to accurately position and support said filament and to reduce the volume within said envelope, said envelope defining cavities about said coil sections for the incandescent operation therein of said coil sections.

3,983,442

ELECTRON GUN CATHODE SUPPORT STRUCTURE

Praveen K. Jariwala, Hammondsport, and Ernest F. Smart, Horseheads, both of N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 19, 1975, Ser. No. 578,797
Int. Cl.² H01J 1/88, 19/42
U.S. Cl. 313—251 3 Claims



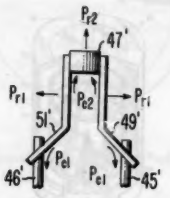
1. An electron gun component comprising a disc-shaped insulator with a centralized aperture through the disc, an elongated cylindrical support sleeve the central portion of which is fitted within the disc aperture and engaged with the disc, with the elongated ends of the support sleeve extending beyond each side of the disc, a generally cylindrical cathode element supported coaxially within the support sleeve and having a closed electron emissive end portion projecting beyond one end of the support sleeve, a plurality of symmetrically spaced elongated support straps connecting and supporting the cylindrical cathode element to the forward end of the support sleeve, wherein the support straps are contoured to a predetermined radius for improved structural stability and wherein the contoured support straps comprise integral extensions from the open end of the cylindrical cathode element with the elongated strap being bent to extend toward the forward end of the support sleeve to which it is connected.

3,983,443

VACUUM ELECTRON DEVICE HAVING DIRECTLY-HEATED MATRIX-CATHODE-HEATER ASSEMBLY

Horst Ernst Paul Schade, Blawenburg, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 24, 1975, Ser. No. 561,440
Int. Cl.² H01J 1/15, 17/08; H01K 1/02
U.S. Cl. 313—341 10 Claims



1. An electron device comprising an evacuated envelope and means for producing an electron emission in said envelope, said means comprising

a. a porous electrically-conducting body having electron-emission material in the pores thereof,

b. at least two electrically-resistive legs attached directly to spaced positions on said body and

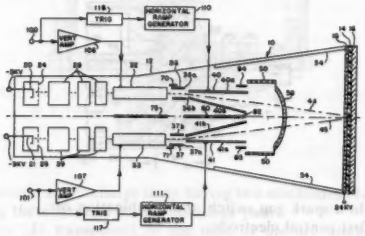
c. connection means for producing a current flow through said body and said legs.

3,983,444

DUAL BEAM CRT WITH INNER GUN AND OUTER GUN SHIELD MEANS FOR CORRECTING KEYSTONE DISTORTION

Conrad John Odenthal, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Division of Ser. No. 486,022, July 5, 1974, Pat. No. 3,921,025.
This application Oct. 24, 1975, Ser. No. 625,612
Int. Cl.² H01J 29/51, 29/82
U.S. Cl. 313—413 3 Claims



1. A horizontal deflection system for a dual electron beam apparatus comprising;

a first and a second pair of horizontal deflection plates disposed side-by-side, each of said pairs of plates including an inner plate and an outer plate spaced from each other;

support means for supporting said deflection plates;

isolation shield means disposed between said first and second pair of deflection plates and being supported by said support means; and

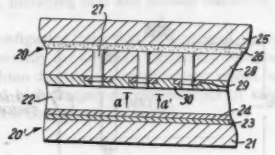
innergun and outergun shield means carried by said isolation shield means and disposed adjacent the exit of said deflection plates for correcting keystone pattern distortion.

3,983,445

PLASMA DISPLAY PANEL INCLUDING ELECTRODES FOR TRAPPING IONS

Susumu Yasuda, and Takao Mimitsuka, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed May 22, 1975, Ser. No. 579,849
Claims priority, application Japan, May 22, 1974, 49-57441
Int. Cl.[2] H01J 63/04
U.S. Cl. 313—485 13 Claims



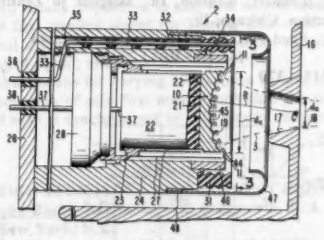
1. A plasma display panel comprising a front board, a rear board spaced from the front board to define a discharge space therebetween, and an ionizable gas filling the discharge space, wherein the improvement comprises a front plate forming part of the front board and a luminescent layer set rendered luminous by excitation from ultraviolet rays affixed to the inside surface of the front plate, a central plate having a number of through holes mounted on the inside surface of the front plate over the luminescent layer set, and a plurality of first electrode members affixed about each of said through holes on an inside surface of said central plate, said electrodes being connected to each other by conductive lines, and said rear board including a rear plate having second electrode members affixed to the inside surface thereof corresponding to said through holes of the central plate.

3,983,446

GRIDDED CONVERGENT FLOW ELECTRON GUN FOR LINEAR BEAM TUBES

George V. Miram, San Mateo County, and Gerhard B. Kuehne, Santa Clara County, both of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed July 6, 1971, Ser. No. 160,045
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976
Int. Cl.[2] H01J 29/02, 29/46
U.S. Cl. 313—452 5 Claims



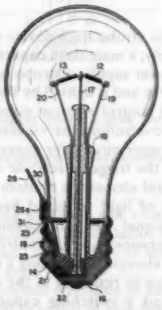
1. In an electron gun; an evacuable envelope structure; thermionic cathode emitter means having a concave emitting surface generally approximating a figure of revolution for emitting a stream of electrons; an accelerating anode means spaced from said cathode emitter and having a central aperture of substantially smaller diameter than the diameter of the concave emitting surface of said cathode emitter, such anode central aperture being disposed in axial alignment with the axis of revolution of said concave emitting surface of said cathode emitter for accelerating and converging a stream of electrons through said aperture into a linear beam of electrons; a multi-apertured concave control grid means disposed overlaying said concave emitting surface of said cathode emitter in spaced relation therefrom for controlling the beam current drawn from said cathode through the apertures in said control grid means; control grid support means for supporting said control grid from the periphery thereof and disposed in electrically insulative and substantially thermally insulative relation relative to said cathode emitter means; said control grid support means being connected in heat exchanging relation with said control grid and including, a thermally conductive support structure surrounding said cathode emitter in thermally insulative relation thereto and thermally communicating through the evacuable envelope of the gun to the surrounds for conducting heat from said control grid to the surrounds of the electron gun and having an electrically insulative thermally conductive first portion interposed within said evacuable envelope in heat exchanging relation between the periphery of said control grid means and an electrically conductive second portion of said grid support structure, said second portion being in physical contact with a portion of said evacuable envelope, said second portion of said grid support structure includes a tubular metallic member surrounding said cathode emitter, and said first portion includes an annular ceramic member joined at one end to said tubular metallic second portion and at the other end to the periphery of said control grid means, a multi-apertured concave focus grid means interposed between said cathode emitter and said multi-apertured control grid means in thermally insulative relation relative to said cathode emitter for focusing the electrons drawn from said cathode emitter through the apertures in said multi-apertured control grid means, the apertures in said focus grid means being aligned along the direction of the convergent beam path with the apertures in said control grid means, a third portion of said grid support means being interposed in heat exchanging relation between the periphery of said focus grid and said second portion of said grid support structure for supporting said focus grid means, and wherein said second portion of said grid support structure is common to said control grid means and said focus grid means for defining a unitary support structure portion providing common support to both of said grid means.

3,983,447

SWITCH AND DUAL LAMP AND SWITCH COMBINATION

Arnold Mark, 2485 Malibu Road; Donald J. Berman, 3091 Seaview Lane, both of Bellmore, and Sam Cohen, 136 Beach 136 St., Bell Harbor, all of N.Y. 11710

Filed May 23, 1975, Ser. No. 580,448
Int. Cl.[2] H01K 1/64
U.S. Cl. 315—64 9 Claims



5. A combination switch and multiple filament light bulb, comprising:

a light bulb having a glass envelope enclosing at least two filaments and a base insulating material, the latter being surrounded by a metallic screw-on section;

a first wire and a second wire extending from said at least two filaments, respectively, into said base insulating material;

at least two substantially vertically extending conductive strips spaced from each other and disposed in said base insulating material and extending upwardly out of the latter along said glass envelope, and each strip having a contact point adjacent an upper end thereof, said strips at a bottom thereof being electrically connected to said first and second wires of said light bulb, respectively;

a center conductive section connected with said base insulating material and insulated thereby from said metallic screw-on section;

a third wire connecting said filaments to said center conductive section;

a handle having a base, the latter being pivotably mounted with respect to said contact points;

conductive means for operatively selectively contacting at least one of said contact points of said at least two conductive strips by a pivotal movement of said handle; and

a conductive member integral with at least a portion of said conductive means and adapted to engage said metallic screw-on section of said light bulb.

3,983,448
AUTOMATIC STROBO FLASH DEVICE

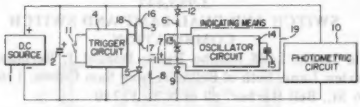
Shinichiro Nakanishi, Higashi-Osaka, Japan, assignor to West Electric Company, Ltd., Japan

Filed May 8, 1975, Ser. No. 575,488

Claims priority, application Japan, May 16, 1974, 49-56159[U]

Int. Cl.² H05B 41/00, 41/32; G03B 15/05

U.S. Cl. 315—151 **8 Claims**



1. An automatic strobo flash device of the type comprising, a DC power supply; a main flash capacitor connected in parallel to said DC power supply; a strobo tube which is coupled to said flash capacitor and is lighted by the discharge of said flash capacitor; a first control element connected in series to said strobo tube for controlling the current flowing through said strobo tube; a trigger circuit for generating the trigger signal to be applied to the trigger electrode of said strobo tube and to said first control element; a photometric circuit for detecting the quantity of light reflected back from a subject and generating the signal when the quantity of reflected light reaches a predetermined level; a control circuit for controlling said first control element comprising a second control element which is turned on in response to the signal from said photometric circuit and a switching capactor; and a circuit for charging said switching capacitor; characterized in that indicating means for indicating the signal during the recharge of said switching capacitor is connected to said switching capacitor charging circuit.

3,983,449
DISCHARGE LAMP BALLAST CIRCUITS

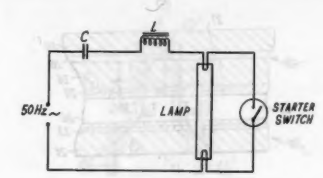
Peter Adrian Dear, and Wladyslaw Pelc, both of London, England, assignors to Thorn Electrical Industries Limited, London, England

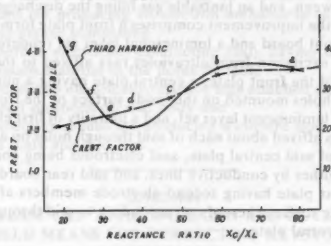
Filed Nov. 24, 1975, Ser. No. 634,549

Claims priority, application United Kingdom, Dec. 11, 1974, 53588/74

Int. Cl.² H05B 41/16

U.S. Cl. 315—244 **14 Claims**





1. In a discharge lamp circuit comprising an a.c. supply, and a discharge lamp, a ballast consisting of a capacitor and an inductor connected in series between the supply and the lamp, the ratio of capacitative reactance provided by the capacitor to inductive reactance provided by the inductor being from about 24 to about 55 at the supply frequency.

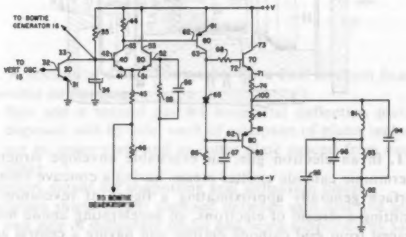
3,983,450
LOW LEVEL PINCUSHION CORRECTION SYSTEM WITH A DUAL IMPEDANCE YOKE

Stanley E. Lehnert, Addison, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Feb. 26, 1975, Ser. No. 553,343

Int. Cl.² H01J 29/56

U.S. Cl. 315—370 **7 Claims**



1. Display means, including a scannable viewing screen having geometry such that pincushion distortion is introduced during scanning comprising:

high frequency scanning means producing high frequency scanning signals for scanning said viewing screen in a first direction;

low frequency scanning means producing low frequency scanning signals for scanning said viewing screen in a second direction;

waveforming means, coupled to said high and low frequency scanning means, producing a pincushion distortion compensation signal having both high and low frequency components;

deflection means, responsive to said low frequency scanning signals, including first and second inductive impedances; and

means configuring said first and second inductive impedances serially for said low frequency components of said pincushion distortion compensation signal, and parallelly for said high frequency components of said pincushion distortion compensation signal.

3,983,451

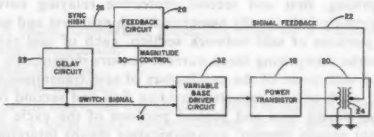
SCAN CONTROL CIRCUIT FOR A VIDEO TERMINAL DISPLAY DEVICE USING FEEDBACK TO CONTROL SYNCHRONIZATION

Michael Leis, Framingham, and Russell C. Doane, Concord, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Apr. 24, 1975, Ser. No. 571,139

Int. Cl.² H01J 29/70

U.S. Cl. 315—387 **14 Claims**



1. A circuit for regulating the scan in a video terminal, said circuit comprising:

A. first means for controlling said scan across said video terminal;

B. second means providing a first and second control signal, said first control signal having a fixed period and said second control signal terminating at a predetermined time after initiation of said first control signal;

C. said first means including means responsive to said first control signal for generating a feedback signal;

D. third means responsive to said first means subsequent to said first control signal for storing from said feedback signal a charge prior to the termination of said second control signal; and

E. fourth means for varying in response to said charge the conduction of said first means such that the position of said scan is synchronized to said second means.

3,983,452

HIGH EFFICIENCY DEFLECTION CIRCUIT

Lucas John Bazin, Stratford, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 31, 1975, Ser. No. 563,878

Int. Cl.² H01J 29/70, 29/76

U.S. Cl. 315—397 **5 Claims**

1. A deflection circuit comprising:

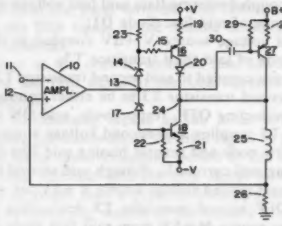
first and second serially coupled transistors forming a push-pull amplifier stage coupled to a first source of relatively low direct operating voltage, a junction of said first and second transistors forming an output terminal;

a deflection winding and a feedback resistor serially coupled to said output terminal and a point of reference potential;

a driver stage coupled to said amplifier stage and said feedback resistor and responsive to a source of input signals for defining trace and retrace intervals during each deflection cycle;

first switching means coupled in a main current conduction path of said first transistor and said deflection winding; and

second switching means coupled to said output terminal and a second source of relatively high direct operating voltage



and responsive to signals obtained from said driver stage for coupling said deflection winding to said second source only during said retrace interval;

said first switching means serving to disconnect the main current conducting path of said first transistor when retrace voltage developed across said deflection winding exceeds said first source voltage, and said feedback resistor sampling current in said deflection winding for determining the end of said retrace interval and the start of the next succeeding trace interval.

3,983,453

SWITCHABLE CONSTANT CURRENT SINK

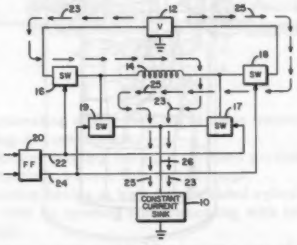
Vernal M. Benrud, Minneapolis, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed May 8, 1974, Ser. No. 467,971

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.² H01J 29/70, 29/76

U.S. Cl. 315—399 **6 Claims**



1. A switchable constant current sink for a CRT display system comprising:

a first transistor T1 having collector, emitter and base electrodes;

a first resistor R1;

a first diode D1 having an anode and a cathode;

means directly intercoupling the collector electrode of said first transistor T1 and the cathode of said first diode D1 for forming a first node;

means coupling the emitter electrode of said first transistor T1 directly to a first terminal of said first resistor R1 the second terminal of which is coupled directly to ground;

V_{REFX} reference voltage source means coupled to said transistor T1 constantly forward biasing the base emitter

junction of said first transistor T1 for controlling a current I_{T1} to constantly flow from said first node, through said first transistor T1 and then through said first resistor R1 to ground;

a second transistor T3 having collector, emitter and base electrodes;

means coupling the emitter electrode of said third transistor T3 to said first node;

a first voltage source V;

an inductive load formed by the X deflection coil of said CRT coupled intermediate said first voltage source V and the anode of said first diode D1;

a second voltage source V $+\Delta V$ coupled to the collector electrode of said third transistor T3;

logic means coupled to said second transistor T3 controlling said second transistor T3 to be either conducting ON or nonconducting OFF, respectively, said ON second transistor T3 coupling said second voltage source V $+\Delta V$ to said first node and reverse biasing said first diode D1 for drawing said current I_{T1} through said second transistor T3 from said second voltage source V $+\Delta V$, or, alternatively, said OFF second transistor T3 decoupling said second voltage source V $+\Delta V$ from said first node and forward biasing said first diode D1 for drawing said current I_{T1} through said inductive load from said first voltage source V.

3,983,454

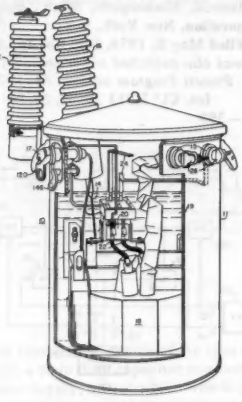
DISTRIBUTION TRANSFORMER SECONDARY CIRCUIT BREAKER

John F. Cotton, Athens, Ga.; Jack G. Hanks, Bethel Park, and Raymond E. Wien, Trafford, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 12, 1974, Ser. No. 496,800

Int. Cl.[2] H02H 7/04; H01H 75/00

U.S. Cl. 317—14 J **17 Claims**



1. A distribution transformer, comprising:

a housing;

primary and secondary transformer coils disposed within said housing;

a circuit interrupter disposed within said housing and operable between a closed position permitting current flow through said transformer and an open position interrupting current flow through said transformer, said circuit interrupter being operable to automatically trip to said open position upon overload current conditions through said transformer;

a handle connected to said circuit breaker for manually operating said circuit breaker between said open and closed positions;

signal means for indicating when current flow through said transformer exceeds a predetermined level; and

signal reset means for ceasing signal indication, said reset means being connected to said handle and resetting said signal means when said handle is operated past the closed position away from the open position.

3,983,455

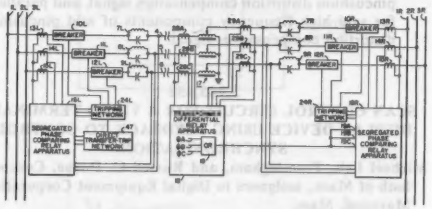
DIRECT TRANSFER-TRIP RELAYING SYSTEM

Walter L. Hinman, Jr., New Providence, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 15, 1975, Ser. No. 541,369

Int. Cl.[2] H02H 7/26

U.S. Cl. 317—27 R **10 Claims**



1. In a segregated phase relaying system for protecting a section of an alternating potential polyphase power transmission network having first and second end portions, said system comprising, first and second protective relaying networks respectively individually associated with said first and second end portions of said network section, each of said relaying networks comprising three current sensors individually associated with three of the conductors of said transmission network, each of said sensors providing first and second output signals during first and second portions of the cycle of the current sensed thereby, communicating means interconnecting said relaying networks and effective to transmit three sets of communicated signals from one of said relaying networks at one of said end portions of said transmission network to the other of said relaying networks at the other of said end portions of said transmission network, each of said sets of communicated signals being individual to said sensors of said one relaying network, each said set of signals comprising first and second transmitted signals corresponding respectively to said first and second output signals of the said sensor with which it is associated, a fault detector associated with said one end portion of said transmission network and effective to provide a fault signal upon the occurrence of a fault in said protected section of said transmission network, said one relaying network including transfer trip initiating means, said trip initiating means being effective when actuated to cause said communicating means to prevent the transmission of said sets of communicated signals under control of said sensors and to cause said communicating means to initiate the transmission of a selected one of said transmitted signals of at least two of said sets of communicated signals, said other relaying network including at least three signal comparing networks, each of said comparing networks having first and second input circuits and an output circuit, first circuit means individually connecting said first input circuits of said networks to individual ones of said sensors of said other relaying network, said other relaying network including a receiver energized by said communicated signals, second circuit means connecting said second input circuits of said networks to said receiver and effective to individually energize said second input circuits of said networks with individual ones of said sets of said communicated signals received by said receiver, a tripping network comprising three tripping circuits, third circuit means individually connecting said tripping circuits to individual output circuits of said comparing networks, each said comparing network being effective when both of its input circuits are

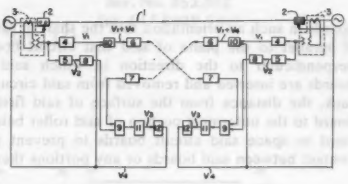
receiving a selected one of said output signals from the said sensor which it is associated and a predetermined one of said communicated signal of said sets of signal to actuate its respective said tripping circuit, and fourth circuit means interconnecting said receiver and said tripping network and effective to provide a tripping output when said receiver is receiving all of said selected ones of all of said sets of communicated signals which are being transmitted.

3,983,456

PHASE COMPARISON PROTECTIVE RELAY FOR A TRANSMISSION

Kenji Suzuki, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed June 11, 1974, Ser. No. 478,371
Claims priority, application Japan, June 11, 1973, 48-65603
Int. Cl.² H02H *3/26, 7/26*
U.S. Cl. 317—28 R **3 Claims**



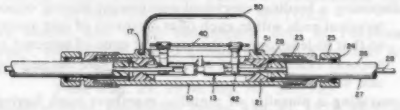
1. A phase comparison protective relay for a transmission line which comprises:
a local terminal;
a remote terminal;
a current converter circuit at the local terminal for generating a local signal corresponding to the local terminal current;
a current converter circuit at the remote terminal for generating a remote signal corresponding to the remote terminal current;
first means at the local terminal for transmitting a first signal during a period when the instantaneous value of the local signal is positive with respect to a predetermined positive level and for transmitting a second signal during another period;
first means at the remote terminal for transmitting a first signal during a period when the instantaneous value of the remote signal is positive with respect to a predetermined positive level and for transmitting a second signal during another period;
second means at the local terminal for transmitting a third signal during a period when the instantaneous value of the local signal is positive with respect to a predetermined negative level and for transmitting a fourth signal during another period;
second means at the remote terminal for transmitting a third signal during a period when the instantaneous value of the remote signal is positive with respect to a predetermined negative level and for transmitting a fourth signal during another period;
a transmitter for transmitting the first and second signals at the local terminal to the remote terminal;
a transmitter for transmitting the first and second signals at the remote terminal to the local terminal;
a receiver at the local terminal for receiving the first and second signals from the remote terminal;
a receiver at the remote terminal for receiving the first and second signals from the local terminal;
third means at the local terminal for transmitting a fifth signal when the overlapping period of the third signal at the local terminal and the first signal at the remote terminal is longer than a predetermined period;
third means at the remote terminal for transmitting a fifth signal when the overlapping period of the third signal at the remote terminal and the first signal at the local terminal is longer than a predetermined period;
said transmitter at the local terminal also functioning for transmitting the fifth signal at the local terminal to the remote terminal;
said transmitter at the remote terminal also functioning for transmitting the fifth signal at the remote terminal to the local terminal;
said receiver at the local terminal also functioning for receiving the fifth signal at the remote terminal from the remote terminal;
said receiver at the remote terminal also functioning for receiving the fifth signal at the local terminal from the local terminal;
said third transmitting means at the local terminal also functioning for transmitting the fifth signal at the remote terminal when the overlapping period of the third signal at the local terminal and the fifth signal at the remote terminal is longer than a predetermined period;
said third transmitting means at the remote terminal also functioning for transmitting the fifth signal at the local terminal when the overlapping period of the third signal at the remote terminal and the fifth signal at the local terminal is longer than a predetermined period;
an automatic breaker at the remote terminal connected to the transmission line, said breaker being opened by the fifth signal transmitted from the local terminal; and
an automatic breaker at the local terminal connected to the transmission line, said breaker at the local terminal being opened by the fifth signal transmitted from the remote terminal.

3,983,457

COAX CABLE SEIZURE DEVICE

Sidney R. Smith, Buckeye, Ariz., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Feb. 18, 1976, Ser. No. 659,182
Int. Cl.² H05K *5/04*
U.S. Cl. 317—99 **10 Claims**

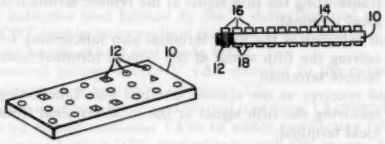


1. A connecting device for coaxial cable transmission lines comprising, in combination:
a conductive housing having a recessed portion extending substantially transversely therethrough;
said housing having at least one threaded cylindrical extension with an opening communicating with said recessed portion;
a dielectric seizure post holder having a pair of tines and at least one aperture extending transversely therebetween;
a seizure post having a pair of tines and at least one aperture extending transversely therebetween, said seizure post being disposed within the aperture of said seizure post holder;
a cylindrical serrated ferrule axially aligned with said seizure post holder and disposed at least partially within the opening formed in said extension;
a cylindrical dielectric guide clamp axially disposed within said opening between said ferrule and said seizure post holder; and
clamping means engaging said threaded extension and mechanically cooperating with both said ferrule and said seizure post holder for providing a lateral clamping force to said ferrule and the tines of said seizure post.

3,983,458
ELECTRICAL DEVICE ASSEMBLY AND METHOD

Lester J. Jordan, Smethport, and Steve Platko, Bradford, both of Pa., assignors to Corning Glass Works, Corning, N.Y.

Filed July 21, 1971, Ser. No. 164,747
Int. Cl.² H05K 1/18
U.S. Cl. 317—101 CP **32 Claims**



1. A device comprising:

a flat dielectric substrate having a plurality of apertures communicating between the flat surfaces thereof,

a leadless electrical component having opposing terminal ends disposed within each of at least two of said apertures, with at least one of the terminal ends of selected components extending beyond at least one of said flat surfaces of said substrate,

a plurality of metallic members each having an aperture therein accommodating one of the terminal ends of one of said electrical components, said metallic members being fixedly attached to the extending terminal ends of selected ones of said components adjacent at least one of the flat surfaces of said substrate, each metallic member providing an external electrical connection to one terminal of one component, and

a conductive path disposed on at least one of the flat surfaces of said substrate electrically connecting terminal ends of selected ones of said components in a desired manner.

20. A method of forming an electrical circuit or network comprising the steps of:

providing a flat dielectric substrate,

forming a plurality of apertures in said substrate communicating between the flat surfaces thereof,

disposing a leadless electrical component having opposing terminal ends within each of at least two of said apertures so that at least one of the terminal ends of selected components extend beyond at least one of said flat surfaces of said substrate,

providing a plurality of metallic members each having an aperture to accommodate a selected one of the extending terminal ends of said electrical components,

electrically connecting said metallic members to said extending terminal ends of said selected ones of said components adjacent at least one of the flat surfaces of said substrate by disposing said extending terminal ends within said apertures, said metallic member, being fixedly maintained in electrical contact with said terminal ends by friction, each said metallic member providing an external electrical connection to one terminal of one component, and

disposing a conductive path on at least one of the flat surfaces of said substrate electrically connecting the terminal ends of selected ones of said components in a desired manner.

3,983,459
CIRCUIT BOARD SPACER

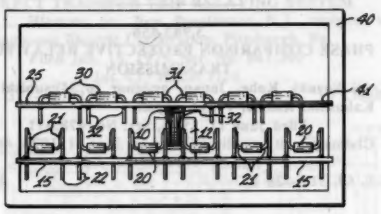
Herbert E. Passler, Phoenix, Ariz., assignor to Honeywell Information Systems, Inc., Waltham, Mass.

Filed July 2, 1975, Ser. No. 592,567
Int. Cl.² H02B 1/02
U.S. Cl. 317—101 DH **6 Claims**

1. A circuit board spacer for maintaining two relatively flexible circuit boards, one overlying the other in a circuit board rack, in physical isolation from one another, said spacer comprising

a roller formed of a pluraity of relatively thin, tough, closely spaced concentric disks mounted on a common shaft, said disks being formed of an electrically insulating material, and

support means for said roller, said support means including means for securing said roller to a first one of said circuit

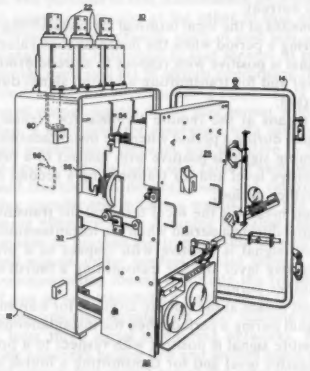


boards in such an orientation that the shaft of said roller is parallel to the plane of said first circuit board and perpendicular to the direction in which said circuit boards are inserted and removed from said circuit board rack, the distance from the surface of said first circuit board to the outermost portion of said roller being sufficient to space said circuit boards to prevent physical contact between said boards or any portions thereof.

3,983,460
ENCLOSED CIRCUIT INTERRUPTER WITH IMPROVED FUSE ASSEMBLY

Edmund W. Kuhn, and Jesse L. Uber, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 2, 1975, Ser. No. 564,576
Int. Cl.² H02B 1/18
U.S. Cl. 317—114 **2 Claims**



1. An enclosed circuit interrupter comprising:

an enclosure;

a drawout type circuit interrupter mounted within said enclosure;

at least one fuse assembly externally mounted upon said enclosure and adapted to support a fuse to be connected in series circuit relationship with said drawout type circuit interrupter;

said enclosure comprising means defining a feed-through aperture, and said fuse assembly comprising a fuse housing of molded insulating material having a fuse cavity internal thereto, a breaker terminal, and a cable terminal;

each of said terminals having first and second ends, said first ends adapted to be connected to a fuse, said second end of said breaker terminal extending through said feed-through aperture and being adapted for connection to said circuit interrupter, said second end of said cable terminal being adapted for connection to a cable; and

said breaker and cable terminals being integrally molded within said housing and including at least one stud resiliently mounted within said housing and adapted to engage a fuse.

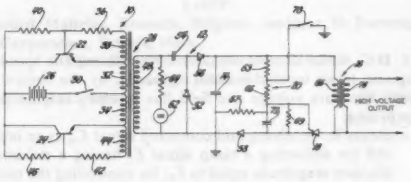
3,983,461
IGNITION PULSE GENERATOR

Richard James Jordan, Roseville, Mich., assignor to General Marine, Inc., Bloomfield Hills, Mich.

Continuation-in-part of Ser. No. 463,001, Dec. 21, 1973, Pat. No. 3,900,786, which is a continuation of Ser. No. 284,309, Aug. 28, 1972, abandoned. This application Feb. 25, 1975, Ser. No. 552,892

Int. Cl.² F02P *9/00*

U.S. Cl. 317—151 **3 Claims**



1. An ignition circuit for internal combustion engines comprising an alternating voltage source, a charging circuit including a coupling capacitor, a rectifier and a storage capacitor connected in series across said source, a thyristor including an anode, a cathode and a gate, a discharging circuit including the anode and cathode of the thyristor, and an ignition coil connected in series across said storage capacitor, control means including switching means for preventing turn-on of the thyristor when closed and enabling turn-on of the thyristor when opened, said control means also including a current leakage resistor having one terminal connected to one terminal of said storage capacitor, an output resistor having one terminal connected to the other terminal of said storage capacitor, and an isolation resistor connected between the leakage resistor and the output resistor, the junction of the output resistor and the isolation resistor being connected to said gate, said switching means being connected between the other terminal of said storage capacitor and the junction of the leakage resistor and the isolation resistor, said switching means being adapted to be alternately closed for a time interval and opened for a time interval in timed relation with operation of the engine, the frequency of said source being high enough in relation to the closed interval of said switching means at maximum engine speed so that there is at least one charging cycle for each closed interval and a controlled discharge pulse is produced through said ignition coil when said switching means is opened, said frequency being high enough in relation to the opened interval at minimum engine speed so that at least one additional charging cycle occurs during each opened interval to produce a free-running discharge pulse through said ignition coil.

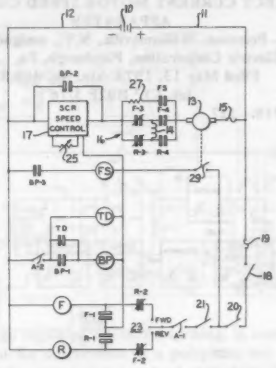
3,983,462
FIELD SHUNTING CONTROL FOR A DC SERIES MOTOR

Francis Lyle Jones, Mentor, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Aug. 15, 1974, Ser. No. 497,656

Int. Cl.² H02P *5/06*

U.S. Cl. 318—139 **9 Claims**



1. In a vehicle powered by a battery and driven by a series DC electric motor having an armature with a series connected field winding and a circuit connected in parallel with the series field winding for shunting a portion of the armature current around the field winding to increase the maximum motor speed, said circuit having a switch therein, an improved speed control including:

means responsive directly to the speed of said motor, closing said switch to complete the field shunt circuit above a selected motor speed.

3,983,463
METHOD AND APPARATUS FOR CONTROLLING THE SPEED OF INDUCTION MOTORS

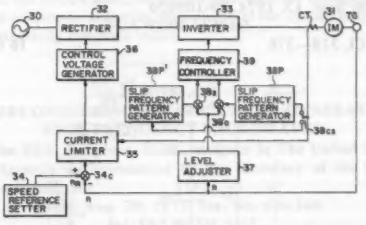
Akira Nabae, and Takeo Shimamura, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Aug. 29, 1974, Ser. No. 501,783

Claims priority, application Japan, Aug. 31, 1973, 48-97242

Int. Cl.² H02P *5/40*

U.S. Cl. 318—227 **18 Claims**



1. In a method of controlling the speed of an induction motor which is energized from a source of variable frequency, the improvement which comprises the steps of producing a control signal which is a function of the primary current of said induction motor, generating a second signal having a predetermined slip frequency pattern in accordance with said control signal, generating a frequency signal proportional to the speed of said induction motor, producing a variable frequency control signal corresponding to the algebraic sum of

said frequency signal and said second signal, and controlling said source in accordance with said variable frequency control siganl for controlling the operating frequency of said source thereby operating said induction motor at or near the maximum value of the torque coefficient thereof.

3,983,464

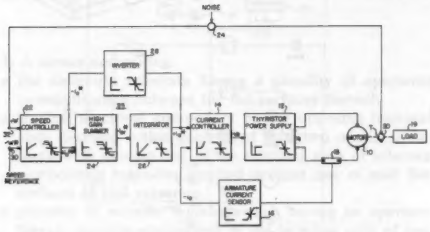
DIRECT CURRENT MOTOR SPEED CONTROL APPARATUS

Robert S. Peterson, Williamsville, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 13, 1974, Ser. No. 469,587

Int. Cl.² H02P 5/16

U.S. Cl. 318—327 **11 Claims**



1. In speed control apparatus for a direct current motor, the combination of

means operative with said motor for supplying the armature current of said motor,

speed control means responsive to the difference between a desired speed and the actual speed of said motor for providing a motor speed determining armature current control signal,

means operative with said armature current control signal, for providing a predetermined limit on the controlled rate of change for all values of said armature current control signal; and

means operative with said armature current supply means for controlling the armature current of said motor in response to said current control signal.

3,983,465

ELECTRIC BRAKING CONTROL APPARATUS FOR DC MOTOR

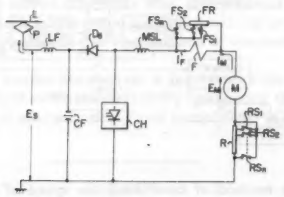
Takashi Tsuboi; Hiroshi Narita, and Toru Higuchi, all of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 15, 1975, Ser. No. 568,195

Claims priority, application Japan, Apr. 17, 1974, 49-42128; Sept. 13, 1974, 49-105070

Int. Cl.² H02P 3/14

U.S. Cl. 318—376 **16 Claims**



1. In an electric braking control apparatus for the DC motor comprising a DC power supply; a series circuit including a smoothing reactor connected in series with said DC power supply, a DC motor with the armature and field winding thereof connected in series with each other, and a resistor; a chopper connected in parallel to said series circuit; and a diode inserted between said DC power supply and said parallel circuit including said series circuit and said chopper; said chopper being turned on and off for effecting the regenerative braking: the improvement further comprising field regulating means for regulating the field of said field winding and resistance regulating means for regulating the resistance value of said resistor, the regenerative braking being effected by combined use of said field regulating means and said resistance regulating means.

3,983,466

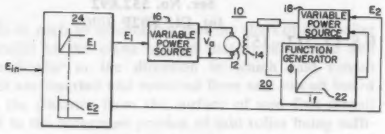
MOTOR FIELD CONTROL FOR D.C. DRIVES

Mohammed Safiuddin, N. Tonawanda, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 19, 1974, Ser. No. 534,531

Int. Cl.² H02P 5/06

U.S. Cl. 318—338 **6 Claims**



1. D.C. motor control circuitry for regulating the speed in response to an input command signal E_{in}, by the control of motor armature voltage and field flux intensity respectively, comprising:

a. means for receiving said command signal E_{in} as an input, and for delivering a ramp signal E_1 having a maximum absolute magnitude equal to E_F, for controlling the motor armature voltage up to base speed;

b. means for potential attenuation, connected to the output of said motor armature voltage control means to receive said signal E_1 and for delivering a signal $-\alpha E_1$ the factor α being adjustable between (0. . .*n*);

c. means for summing three inputs: a first input connected to a source of potential $-E_F$, a second input connected to receive said signal E_{in}, and a third input connected to receive said attenuation signal $-\alpha E_1$, said summation means delivering an output E_2 for field flux control beyond base speed, where $E_2 = E_F - E_{in} + \alpha E_1$, whereby the selection of the factor α determines the cross-over point between motor armature voltage and field flux speed controls.

3,983,467

COARSE/FINE SHEETER CONTROLS IN PARTICULAR AND MACHINE DRIVE SYSTEMS IN GENERAL

Walter Howard Bossons, and Colin George Langworthy, both of Bristol, England, assignors to Masson Scott Thrissell Engineering Limited, Bristol, England

Filed Nov. 15, 1974, Ser. No. 524,343

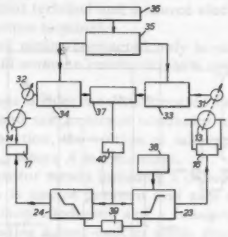
Claims priority, application United Kingdom, Nov. 17, 1973, 53476/73

Int. Cl.² G05F 1/46; G05B 7/02

U.S. Cl. 318—593 **5 Claims**

1. A continuous web cutting machine comprising rotary web feed mechanism, rotary cutting means downstream thereof and means for driving the feed mechanism and the cutting means at a selected average velocity ratio, wherein the improvement comprises providing respective separate variable speed electric motors continuously to drive the feed mechanism and the cutting means, coarse motor control means for governing the cutting means motor to adjust the

speed of the latter to within a given range, and fine motor control means, operable when said given range is achieved, for



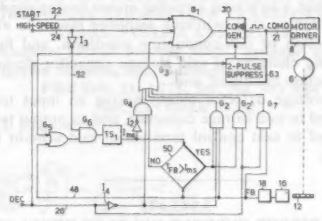
governing the feed mechanism motor to achieve said selected average velocity ratio.

3,983,468

MOTOR DRIVE SYSTEM INCLUDING A FEEDBACK LOOP

Gerard Maitrias, Brussels, Belgium, assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 30, 1974, Ser. No. 537,588
Int. Cl.² H02K *37/00*
U.S. Cl. 318—685 **25 Claims**



1. A motor drive system for driving a motor incrementally in accordance with the generation of motion-command-pulses supplied thereto, the drive system comprising a motor-starting and speed-regulation control including:

motor-rotation sensing means for sensing the rotation of the motor and generating in response thereto a feedback pulse for each movement of the motor a predetermined increment;

timing means for measuring a predetermined time interval after the starting of the timing means;

means for starting the timing means with each generation of a feedback pulse; and

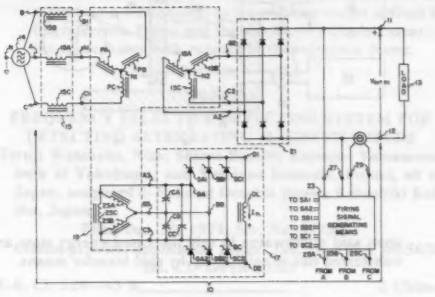
means for comparing the length of said predetermined time interval to the length of the time interval between consecutive feedback pulses and for generating a motion-command-pulse at the end of the longer of either said predetermined time interval or said time interval between consecutive feed-back pulses; whereby the motor rotates at a speed limited to a regulated speed in which the time of each increment of movement is not less than said predetermined time interval.

3,983,469

CONTROLLED REACTANCE REGULATOR CIRCUIT

Harold J. Brown, Lorain, Ohio, assignor to Lorain Products Corporation, Lorain, Ohio

Filed Feb. 3, 1975, Ser. No. 546,554
Int. Cl.² H02M *7/155*
U.S. Cl. 321—9 R **18 Claims**



15. A voltage regulator circuit comprising, in combination, a circuit input for connection to a polyphase a-c source, a circuit output for connection to a load, polyphase line inductance means for supporting a voltage dependent upon the difference in voltages between the a-c voltages at the circuit input and the voltage at the circuit output, a transformer having a set of polyphase primary windings, having a first set of polyphase secondary windings and having a second set of polyphase secondary windings, means for connecting the line inductance means between the circuit input and the primary windings, means for connecting the first set of secondary windings to the circuit output, at least three capacitors connected in a closed circuit path such that each capacitor can exchange charge with each adjacent capacitor, the capacitors serving as means for drawing a leading component of current from the circuit input through the line inductance means and the transformer, means for connecting the capacitors to the second set of secondary windings, controllable switching means for sequentially conducting a resonant discharge current pulse through each capacitor to reverse the polarity of the charge across that capacitor and redistribute charge among the then remaining capacitors, each resonant discharge current pulse having a resonant discharge frequency of from three to ten times the frequency of the voltage at the circuit input, and control means for changing the phase relationship between said resonant discharge current pulses and the voltages at the circuit input, in accordance with the voltage at the circuit output, to maintain the voltage at the circuit output at a substantially constant value.

3,983,470

SUPERCONDUCTING APPARATUS FOR GENERATING HIGH FREQUENCY MICROWAVES

G. John Dick, Pasadena, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 20, 1975, Ser. No. 606,160
Int. Cl.² H02M *5/02*
U.S. Cl. 321—60 **10 Claims**

1. A superconducting microwave frequency conversion apparatus comprising:

a. a cavity with superconducting walls;

b. injection means for injecting microwaves into said cavity;

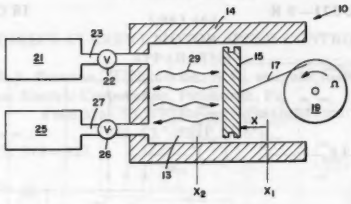
c. transfer means for transferring microwaves out of said cavity;

d. said cavity being deformable;

e. deformation means for deforming said cavity; whereby

f. microwaves are injected into said cavity by said injection

means, said cavity is deformed by said deformation means to increase the energy state of said microwaves, where-



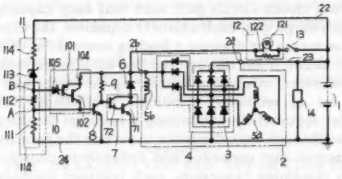
upon said microwaves in said increased energy state are transferred out of said cavity by said transfer means.

3,983,471

VOLTAGE REGULATING SYSTEM

Katsumi Itoh, Ohbu, and Kazumasa Mori, Aichi, both of Japan, assignors to Nippondenso Co., Ltd., Japan

Filed Feb. 5, 1975, Ser. No. 567,952
Claims priority, application Japan, Feb. 2, 1975, 49-16659
Int. Cl.² H02H 7/06; H02J 7/16
U.S. Cl. 322—28 6 Claims



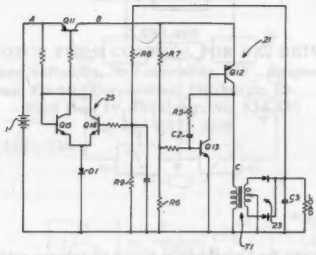
1. A voltage regulating system comprising;
an alternating current generator having an output winding and a field winding;
a full-wave rectifier connected with said output winding and providing a positive and negative direct current terminal;
a battery connected across said positive and negative terminal by conductors;
rectifier means connected with said full-wave rectifier and providing one other positive direct current terminal;
a field control circuit connected at one end thereof with said other positive terminal through said field winding and with said negative terminal at the other end thereof;
a control transistor connected with said field control circuit;
a voltage sensing circuit connected across said battery and further connected with said control transistor;
an additional circuit containing an emitter-base path of a PNP transistor and a zener diode connected between said other positive terminal and said voltage sensing circuit; and
a collector-emitter path of a NPN transistor connected between said other positive terminal and the base of said control transistor, the base of said NPN transistor being connected with the collector of said PNP transistor.

3,983,472

CHOKELESS SCHMITT-TRIGGER REGULATOR

David Morris, Brooklyn, N.Y., assignor to Litton Business Systems, Inc., Morris Plains, N.J.

Filed Mar. 11, 1974, Ser. No. 449,688
Int. Cl.² H02M 3/335
U.S. Cl. 323—17 5 Claims



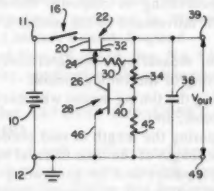
1. An electrical power supply comprising:
first coupling means for coupling a direct current input voltage source;
second coupling means for coupling a regulated voltage to an output load;
schmitt trigger means having an input terminal, an output terminal, and a control terminal;
a storage capacitor directly coupled across said output load;
and non-conduction conditions, comprising a switching regulator means and an oscillator, said switching regulator means having an input terminal coupled to said first coupling means, a control terminal coupled to said output terminal of said schmitt trigger means, and an output terminal coupled to the input of said oscillator, the output of said oscillator coupled to the input of said storage capacitor, a switching amplifier means having conduction for switching said switching amplifier means to either a conduction or non-conduction condition, and for only allowing charging of said storage capacitor during said conduction condition; and
output voltage detector means having an input terminal coupled to said storage capacitor, and an output terminal coupled to said control terminal of said schmitt trigger means.

3,983,473

SERIES DIRECT-CURRENT VOLTAGE REGULATOR

Albert E. Sanderson, Carlisle, Mass., assignor to Inventronics, Inc., Carlisle, Mass.

Filed May 6, 1974, Ser. No. 466,992
Int. Cl.² G05F 1/58
U.S. Cl. 323—22 R 4 Claims



1. A circuit for producing an output voltage, V_{out}, that is independent of variations of an input voltage and that varies predictably in response to changes in ambient temperature under constant load conditions, said circuit comprising:

A. a common conductor,

B. an input terminal for coupling, with said common conductor, the input voltage to said circuit,

C. an output terminal for coupling, with said common conductor, the output voltage from said circuit,

D. a series regulating, junction-type field effect transistor having a gate electrode, a drain electrode connected to said input terminal and a source electrode connected to said output terminal,

E. control means connected only to said output terminal and said common conductor, said control means including:

i. voltage divider means connected to said output terminal and said common conductor and including a tap connection, the voltage at said tap connection being AV_{out} where A is a constant,

ii. transistor means including a collector-emitter current path in circuit between said gate electrode and said common conductor and a base-emitter current path including a base-emitter diode junction connected to said tap connection, the temperature of said diode junction being the ambient temperature and said diode junction being forward biased by the voltage at said tap connection, the voltage across said diode junction being V_{be} and the current through said diode junction controlling the conductivity of said collector-emitter current path, and

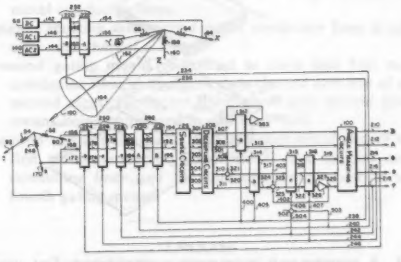
iii. a constant-current source connected to said output terminal as the sole source of current to said collector-emitter current path, all the current from said constant-current source passing through said collector-emitter path and the output voltage from said circuit being $V_{out}=V_{be}/A$ wherein the voltage across said forward biased diode junction, V_{be}, and therefore the output voltage V_{out}, vary predictably in accordance with the ambient temperature.

3,983,474

TRACKING AND DETERMINING ORIENTATION OF OBJECT USING COORDINATE TRANSFORMATION MEANS, SYSTEM AND PROCESS

Jack Kuipers, Grand Rapids, Mich., assignor to Polhemus Navigation Sciences, Inc., Burlington, Vt.

Filed Feb. 21, 1975, Ser. No. 551,984
Int. Cl.² G01R 33/02
U.S. Cl. 324—43 R **10 Claims**



1. An object locating system in which the object is free to translate and orient in three dimensions and which comprises:

three orthogonal radiators for defining a reference coordinate frame and for radiating a directable nutating field about a pointing vector direction;

a pointing coordinate frame having the *x*-axis coincident with the pointing vector direction and the *y*-axis in the *x*-*y* plane of the reference frame;

three orthogonal sensors located at the object to be tracked for sensing the nutating field and for defining a sense coordinate frame;

sources of signals to be passed through each of the three radiators;

means for measuring signals induced in the sensors;

means for processing the signals induced in the sensors to determine the translation displacement of the sense frame with respect to the x-axis of the pointing frame and the orientation displacement of the sense frame with respect to the pointing frame; and

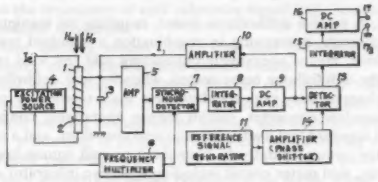
means for determining the translation displacement of the sense frame with respect to the pointing vector defined in the reference frame and the orientation displacement of the sense frame with respect to the reference frame.

3,983,475

FREQUENCY SELECTIVE DETECTING SYSTEM FOR DETECTING ALTERNATING MAGNETIC FIELDS

Teruji Watanabe, Niza; Shizuo Suzuki; Kazuomi Yamamura, both of Yokohama, and Yoshinao Iwamoto, Fujimi, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed Dec. 30, 1974, Ser. No. 537,417
Claims priority, application Japan, Jan. 10, 1974, 49-5638
Int. Cl.² G01R 33/02
U.S. Cl. 324—43 R **2 Claims**



1. A system for detecting alternating magnetic fields comprising: a magnetic sensing element comprised of a parametrically excited second harmonic oscillator having an output winding for developing an oscillatory outout signal therein, an excitation signal source for applying to the magnetic sensing element an alternating exciting current having a frequency higher than a frequency of an alternating magnetic field to be detected, a frequency doubler receptive of the excitation signal for developing an output signal having a frequency equal to twice the excitation signal frequency, a synchronous detector for synchronous detection of an oscillatory output signal of the magnetic sensing element in synchronism with the frequency doubler output signal, a first integrator for integrating the output of the synchronous detector and having an integration time constant sufficiently shorter than the period of the alternating magnetic field to be detected to provide an integrated output having a polarity corresponding to the phase of the oscillation output signal of the magnetic detecting element and an instantaneous magnitude corresponding to the amplitude of the oscillation output signal, means defining a feedback path for negatively feeding back the output of the first integrator to the output winding of the magnetic sensing element, a reference signal generator for generating a reference signal of a frequency substantially equal to the frequency of the alternating magnetic field to be detected, a detector for detecting the output of the first integrator in synchronism with the reference signal, and a second integrator for integrating the output of the detector and having an integration time constant longer than the period of the alternating magnetic field to be detected to obtain an integrated output having an instantaneous magnitude which varies in accordance with the phase- difference between the reference signal and the output of the first integrator and proportional to the amplitude of an AC signal included in the output of the first integrator which is representative of the alternating magnetic field to be detected, whereby the output of the second integrator is em-

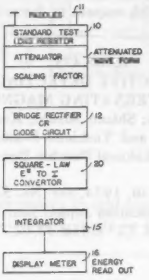
ployed to detect an alternating field of a frequency close to the frequency of the reference signal.

3,983,476

DEFIBRILLATOR TESTING DEVICE

Francis Konopasek, 151 Marine Drive, Rottingdean, England

Filed June 28, 1974, Ser. No. 484,124
Int. Cl.² G01R 15/08, 15/10
U.S. Cl. 324—111 4 Claims



1. A passive defibrillator tester, requiring no manipulation of controls, comprising in combination a standard test load resistor, means operatively connecting said test load resistor to the defibrillator being tested, whereby said defibrillator is discharged into said standard test load resistor, a passive square-law converter, circuit means operatively connecting said standard test load resistor to said converter, and a passive meter circuit operatively connected to said square-law converter, said meter circuit including a passive integrator circuit and a display meter to indicate the true delivered watt seconds input from the defibrillator being tested, into the standard test load resistor, and switch means between said standard test load resistor and said converter, a pair of variable resistors in parallel between said standard test load resistor and said switch means, said switch means placing one variable resistor or the other variable resistor in circuit thereby scaling said meter to one range or another range, said integrator circuit including a diode and capacitor network in said meter circuit.

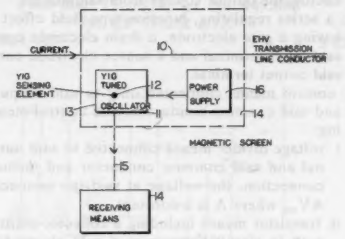
3,983,477

DEVICE FOR MEASURING EXTRA HIGH VOLTAGE LINE CURRENT

Stanislaw Szczesny Stuchly, Winnipeg, Canada; Michael Napoleon Rzewuski, Warsaw, Poland, and Michael Zenon Tarnawecky, Winnipeg, Canada, assignors to Manitoba Research Council, Winnipeg, Canada

Filed May 29, 1974, Ser. No. 474,168
Int. Cl.² G01R 19/00, 19/26
U.S. Cl. 324—117 R 6 Claims

1. An electrical measuring device adapted to sense an electrical current flowing in a conductor of an extra high voltage electrical transmission line in a region of high potential, and to transmit a generated signal corresponding to said current, to receiving means in a region of relatively low potential in order to provide an output signal related to said electrical current; comprising in combination a single crystal yttrium-iron-garnett sensing element magnetically coupled to said extra high voltage transmission line in said region of high potential, an electrical oscillator, operatively connected to said sensing element whereby said sensing element tunes said oscillator, for generating a signal whose frequency is related to the current flowing in said extra high voltage transmission line, temperature compensated regulated power supply means in said region of high potential for operating said electrical oscillator, microwave transmission means operatively connected to said oscillator for transmitting the generated signal from said region of high potential, receiving means in said region of relatively low potential for receiving the signal from said transmission means, and means in said region of relatively



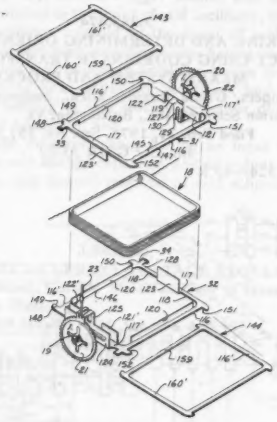
low potential for converting said received signal into an output signal, which is related to the electrical current flowing in said extra high voltage transmission line.

3,983,478

MOVING COIL INSTRUMENT HAVING ELECTRICALLY CONDUCTIVE COIL FORM PARTS CONNECTED TO THE COIL

David B. Pearson, Raritan, N.J., assignor to Weston Instruments, Inc., Newark, N.J.

Division of Ser. No. 391,496, Aug. 24, 1973, Pat. No. 3,882,389, which is a division of Ser. No. 173,425, Aug. 20, 1971, Pat. No. 3,764,909. This application Dec. 12, 1974, Ser. No. 532,246
Int. Cl.² G01R 5/02, 1/04, 1/14
U.S. Cl. 324—154 R 23 Claims



1. A moving coil instrument comprising: a first unitary electrically conductive coil form part, a second unitary electrically conductive coil form part mounted adjacent, and in spaced, electrically insulated relation to the first coil form part, coil support means on the coil form parts, a coil extending around the coil support means and bridging said coil form parts, said coil including a winding having ends electrically connected respectively to said coil form parts, said coil form parts and coil comprising a coil assembly; first and second coil assembly supports; support means mounting said coil assembly supports in electrically insulated relation to each other; electrically conductive means connected between said first coil form part and said first support, and between said second

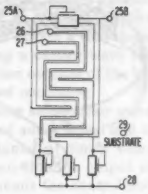
coil form part and said second support, so that an electrical connection can be made to said coil from said supports.

3,983,479

ELECTRICAL DEFECT MONITOR STRUCTURE

James H. Lee; Akella V. S. Satya, both of Wappingers Falls, N.Y.; Ashwin K. Ghatalia, Essex Junction, and Donald R. Thomas, Westford, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 23, 1975, Ser. No. 598,480
Int. Cl.² G01R 31/26
U.S. Cl. 324—158 R 5 Claims



1. An electrical defect-monitor structure for semiconductor wafers comprising:

a plurality of coextending serpentine first diffusions,

two-spaced coextending second diffusions sandwiching said first diffusions therebetween and having lateral extensions extending into the valleys of said first diffusions,

first gating means shorting said second diffusions at adjacent ends thereof,

first gating means in each of said first diffusions and one of said second diffusions at common ends thereof, all of said gating means being connected in common,

test contact pads adjacent each distal end of said first diffusions, one of said diffusions and the common connection of said first gating means,

an insulating layer over said first and second diffusions,

a plurality of serpentine first metal conductor lines on said insulating layer and extending transversely to said plurality of first diffusions,

two spaced second metal conductor lines sandwiching said first metal conductor lines therebetween and having lateral extensions extending into the valleys of said first metal conductor lines,

means shorting said second metal conductor lines at adjacent ends thereof,

second gating means connected to each said first metal conductor lines at common ends thereof and one of said second metal conductor lines, all of said second gating means being connected in common, and

second test contact pads, adjacent each distal end of said first metal conductor lines, one of said second metal conductor lines and the common connection of said fourth gating means.

3,983,480

CALIBRATION CIRCUIT AND METHOD

Francis P. Meserow, Highland Park, and Frank H. Mills, Chicago, both of Ill., assignors to Alston, Inc., Chicago, Ill.

Filed Jan. 29, 1975, Ser. No. 544,972
Int. Cl.² G01P 21/00, 3/48
U.S. Cl. 324—169 4 Claims

1. In combination, an impulse tachometer and a calibration circuit therefor, said tachometer including:

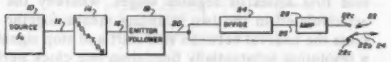
means for generating constant amplitude electrical pulses in response to the application of electrical pulses at the input thereof, said constant amplitude electrical pulses having a repetition rate equal to the repetition rate of said applied electrical pulses;

means for alternatively applying to the input of said constant amplitude pulse generating means either said input electrical pulses having a repetition rate determined by the speed of rotation of a rotating device or simulating electrical pulses produced by said calibration circuit; and

means for displaying said speed of rotation in response to said constant amplitude electrical pulses as a function of the repetition rate and duration thereof; and means for adjusting the duration of said constant amplitude pulses, whereby said display means may be calibrated to accurately display the speed of rotation represented by said input pulses;

said calibration circuit generating electrical pulses of known repetition rate at the output thereof for simulating a selected speed of rotation, and including:

means for connecting the input of said calibration circuit to a line source generating a reference signal of known frequency;



optoisolator circuit means, said optoisolator circuit means producing electrical pulses having a repetition rate equal to the frequency of said reference signal and electrically isolated therefrom;

current limiting means connecting said reference signal source to said optoisolator circuit means,

means connecting the output of said optoisolator circuit means to the input of pulse altering circuit means, said pulse altering circuit means altering said electrical pulses by producing at its output electrical pulses having a reduced repetition rate equal to one electrical pulse for every x electrical pulses received at its input, where x is an integer greater than 1; and

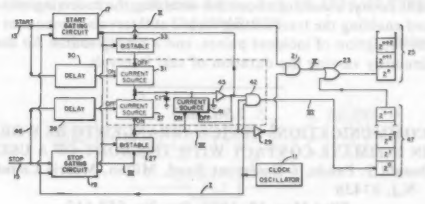
switch means selectively operable to provide at the output of said calibration circuit as said simulating electrical pulses either said produced electrical pulses or said altered electrical pulses.

3,983,481

DIGITAL INTERVALOMETER

Ronald Nutt, Knoxville; Kelly Milam, Concord, and Charles W. Williams, Powell, all of Tenn., assignors to Ortec Incorporated, Oak Ridge, Tenn.

Filed Aug. 4, 1975, Ser. No. 601,907
Int. Cl.² G04F 8/00
U.S. Cl. 324—186 8 Claims



1. Apparatus for providing a digital measurement of the interval between start and stop signals, said apparatus comprising:

a clock signal source providing a pulsatile clock signal having an accurately predetermined period;

a timing capacitor;

means for charging said chapacitor, starting at a predetermined starting voltage, at a first predetermined rate from the occurrence of said start signal to a subsequent clock

pulse and for charging said capacitor at said first predetermined rate from the occurrence of a clock pulse subsequent to said stop signal to a time following said stop signal by an interval corresponding to an integer number of clock periods;

means including a first series of counting register stages for counting clock periods between said clock pulse subsequent to said start signal and said clock pulse subsequent to said stop signal;

means operative after the second charging interval for discharging said capacitor at a second predetermined rate which is substantially less than said first rate and which is an integer fraction of said first rate; and

means including a second series of counting register stages for counting clock periods during discharging of said capacitor back to said predetermined starting voltage, the two counting means being provided with means permitting carrys from the most significant stage of said second series of register stages to the least significant stage of said first series of register stages, whereby the count accumulated in the two counting means togethr represents the interval between said start and stop signals with a resolution substantially finer than one clock period.

3,983,482

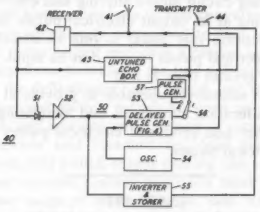
DELAYED PULSE TRANSMISSION SYSTEMS

William H. Doherty, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 14, 1951, Ser. No. 256,273

Int. Cl.[2] H04K *3/00*

U.S. Cl. 325—6 **5 Claims**



1. In combination, means normally unblocked for receiving incident wave energy pulses, a multi-resonant cavity supplied with the received pulses for storage of the radio frequency energy in said pulses, means normally blocked to be supplied with the received pulse energy for transmitting said received pulse energy after storage for a finite time in said multi-resonant cavity, a control circuit for disabling the receiving means and enabling the transmitting means at intervals subsequent to the reception of incident pulses, and a timing source for continuously varying the duration of said intervals.

3,983,483

COMMUNICATIONS DEVICE ARRANGED TO BE WORN IN INTIMATE CONTACT WITH THE BODY OF A USER

Donald J. Pando, 6 Rosemont Road, Milton, Morris County, N.J. 07438

Filed Mar. 10, 1975, Ser. No. 557,112

Int. Cl.[2] H04B *1/04*

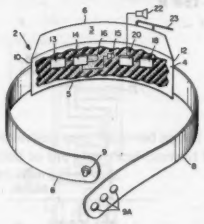
U.S. Cl. 325—16 **18 Claims**

1. A communications device adapted to be worn in intimate contact with th body of a user comprising:

circuitry including a radio transmitter having a power supply and a microphone connected thereto, an amplifier stage including a first transistor and a first capacitor connected to the collector of the first transistor, an oscillator stage including a second transistor with the base thereof connected to the first capacitor, and a radio receiver having a power supply, an antenna and an earphone connected thereto;

a collar for housing the circuitry and including a strap for supporting the collar about the neck of the user so as to be in intimate contact therewith, said collar and circuitry housed within the collar arranged for permitting communication with a remote station while maintaining maximum body mobility;

said collar being generally oblong in shape and including a longitudinally convex face and a longitudinally concave face adjacent the neck, substantially parallel upper and



lower edges and substantially parallel opposite ends separating the convex and concave faces, and the strap extending from the opposite ends and being integral with the concave face; and

means included in the transmitter and operative with the body of the user when the collar is worn in intimate contact with the neck for providing a predetermined transmission frequency range and including a grounded conductor for providing one plate of a second capacitor, with the body of the user being effectively connected to the collector of the second transistor for providing the other plate of the second capacitor.

3,983,484

MULTICHANNEL SIGNAL TRANSMITTING AND RECEIVING APPARATUS

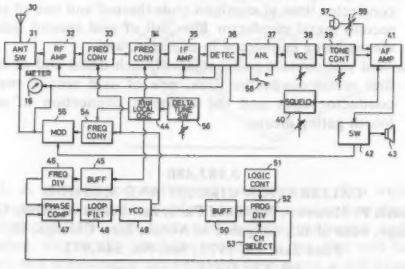
Takuo Hodama, Okegawa, Japan, assignor to Nihon Dengyo Co., Ltd., Tokyo, Japan

Filed May 9, 1975, Ser. No. 576,238

Claims priority, application Japan, Dec. 6, 1974, 49-146912[U], Apr. 10, 1975, 50-47590

Int. Cl.[2] H04B *1/40*

U.S. Cl. 325—20 **5 Claims**



1. A multichannel signal transmitting and receiving apparatus comprising:

a single reference local oscillator producing a signal of an output oscillation frequency;

a first frequency divider for dividing said output oscillation frequency with a specific frequency division ratio and producing an output;

a phase locked loop circuit having a phase comparator receiving at one input thereof said output of the first frequency divider and producing an output, and a voltage controlled oscillator producing an output of an oscillation frequency controlled by said output of the phase comparator;

a second frequency divider for frequency dividing the output of the voltage controlled oscillator with a frequency division ratio in accordance with each of a plurality of channels to produce a corresponding output and supplying said corresponding output as another input to the phase comparator;

means for subjecting a signal received through an antenna to heterodyning by the oscillation output of the local oscillator and the oscillation output of the voltage controlled oscillator and thereafter detecting the resulting signal, thereby to obtain a first audio signal;

means for obtaining a carrier wave for signal transmission from the oscillation outputs of the local oscillator and the voltage controlled oscillator;

means for modulating said carrier wave for signal transmission with a second audio signal and transmitting the same through the antenna at times when said heterodyning means receives no antenna output signal;

first changeover means for controllably changing over the oscillation frequency of the local oscillator between different values respectively for signal reception and transmission; and

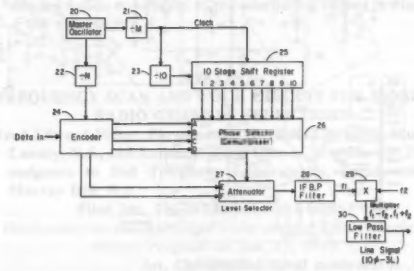
second changeover means for controllably changing over the frequency division ratio of the second frequency divider between different values respectively for signal transmission and reception for each of said channels.

3,983,485

MULTI-PHASE AND MULTI-AMPLITUDE LEVEL MODULATOR AND MODULATION AND DEMODULATION METHODS

Richard L. Stuart, Simpsonville, Md., assignor to Rixon Inc., Silver Spring, Md.

Filed Feb. 28, 1975, Ser. No. 554,112
Int. Cl.² H04L 27/20
U.S. Cl. 325—30 **32 Claims**



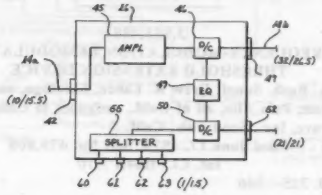
1. A multi-phase, multi-amplitude level modulation method comprising generating a carrier signal, generating a modulating signal having first, second and third amplitude levels and ten phases, and modulating said carrier with said first, second and third amplitude levels and ten phases to produce sixteen signal states, said first level corresponding to carrier off operation and providing a first signal state, said second level comprising an intermediate level and said carrier being modulated at five equally spaced phases for said second level to provide five of said sixteen signal states, and said third level comprising an amplitude level which is substantially higher than said intermediate level and said carrier being modulated at ten equally spaced phases for said third level to provide ten of said sixteen signal states, alternate/equally spaced phases of said third level being in phase with respective phases of the five phases of the second level.

3,983,486

MODULAR CATV SYSTEM

William A. Rheinfelder, Phoenix, Ariz., assignor to Alpha Engineering Corporation, Phoenix, Ariz.

Filed Nov. 29, 1974, Ser. No. 528,459
Int. Cl.² H04N 7/10
U.S. Cl. 325—308 **17 Claims**



1. In a CATV system having cables with amplifying means spaced along said cables at predetermined unit intervals, or fractions thereof, to compensate for the attenuation of the signals being carried by said cables, the improvement comprising:

a. amplifying means for receiving said signals as input signals and having a first and a second output terminal;

b. said amplifying means including means for amplifying said input signals to a first level equal to the input signal levels plus the attenuation of said signals incurred by said signals while traveling said unit interval;

c. means connecting signals amplified to said first level to said first output terminal;

d. said amplifying means also including means for amplifying said input signals to a second level equal to the input signal levels plus a fraction of the attenuation of said signals incurred by said signals while traveling said unit interval;

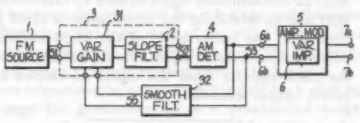
e. means connecting signals amplified to said second level to said second output terminal.

3,983,487

FM-AM CONVERTER

Masaharu Ohno, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 6, 1975, Ser. No. 602,186
Claims priority, application Japan, Aug. 14, 1974, 49-92903
Int. Cl.² H04B 1/06
U.S. Cl. 325—315 **7 Claims**



1. An FM-AM converter comprising:

A. a transmission system comprising a slope filter having a frequency response that varies monotonically over a predetermined frequency band;

B. means to apply an FM signal to said filter, said FM signal being within said frequency band, whereby said FM signal is modified by said filter to an amplitude modulated FM signal, the envelope of which corresponds to the signal that modulates the frequency of said FM signal;

C. a carrier signal source;

D. means connected to said transmission system to receive the amplitude modulated FM signal from said filter and connected to said carrier source to receive the carrier signal therefrom and to modulate the amplitude of said carrier signal by a signal corresponding to the envelope of said amplitude modulated FM signal; and

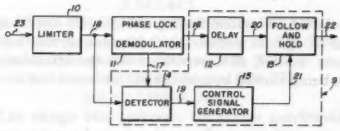
E. control means responsive to the mean value of the signal corresponding to the envelope of said amplitude modulated FM signal to control said transmission system to maintain the mean value of said amplitude modulated FM signal substantially constant.

3,983,488

FREQUENCY-MODULATION DEMODULATOR THRESHOLD EXTENSION DEVICE

John A. Bush, Sunol; Drew R. Lance, Saratoga, and John E. Altstatt, Palo Alto, all of Calif., assignors to California Microwave, Inc., Sunnyvale, Calif.

Filed June 17, 1974, Ser. No. 479,808
Int. Cl.² H04B 1/10
U.S. Cl. 325—346 **11 Claims**



1. A threshold extension circuit for use in a receiver having a phase locked demodulator, comprising:

a delay means and a follow-and-hold means coupled together in a series circuit for connecting the output of the demodulator to a receiver output terminal, said delay means being operative to delay the demodulated signal developed by the demodulator for a predetermined period of time, said follow-and-hold means being responsive to a control signal and operative to interrupt said series circuit and to hold the signal level at the output terminal constant during such interruption;

detector means having a first input for receiving the VCO signal developed by the voltage controlled oscillator of the demodulator and a second input for receiving an IF signal input to the demodulator, said detector being operative to detect a relative phase shift of greater than 180° between said IF signal and said VCO signal and to develop a detector output signal; and

control signal generating means responsive to said detector output signal and operative to generate said control signal, said control signal causing said follow-and-hold means to interrupt said series circuit a short period of time before the occurrence of a click impulse in the delayed demodulated signal caused by said relative phase shift and to terminate the interruption a short period of time after the occurrence of the click impulse in the delayed demodulated signal thereby effectively removing the click impulse from the signal developed at the receiver output terminal.

3,983,489

DOUBLING MIXER

Norman C. Gittinger, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

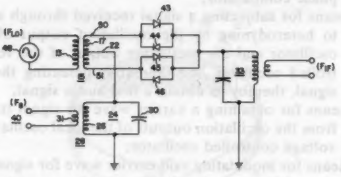
Filed June 16, 1975, Ser. No. 586,876
Int. Cl.² H04B 1/26
U.S. Cl. 325—449 **2 Claims**

1. A balanced doubling mixer comprising:

radio frequency transformer means including a primary winding adapted to be connected to a source of local oscillator signals at a first radio frequency and a center tapped secondary winding having a first and second end;

first tuned circuit means connected to said center tap, said tuned circuit means including an input port adapted to be connected to a source of radio frequency signals at a second radio frequency;

first diode means including at least two semiconductor diodes connected in back-to-back circuit relationship, a first end of said diode means connected to said first end of said secondary winding,



second diode means including at least two semiconductor diodes connected in back-to-back circuit relationship, a first end of said diode means connected to said second end of said secondary winding;

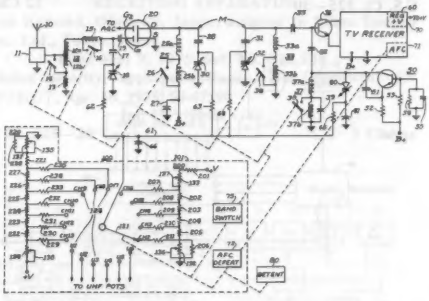
second tuned circuit means tuned to the output frequency of said mixer connected to the second ends of each of said first and second diode means, said second tuned circuit means including an output port, said output port producing an output signal at a frequency equal to the sum or difference of said second radio frequency and twice said first radio frequency.

3,983,490

SIGNAL OVERLOAD PROTECTION CIRCUIT FOR VARACTOR TUNER

John Y. Ma, Glenview, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Aug. 5, 1975, Ser. No. 602,172
Int. Cl.² H04B 1/18
U.S. Cl. 325—452 **8 Claims**



1. A television tuner comprising:

a tunable circuit including a varactor diode providing the variable capacitance therefor;

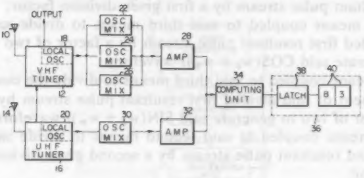
means applying a DC tuning voltage to bias said varactor diode for adjusting the resonance of said tunable circuit to receive and translate broadcast television signals in a given frequency spectrum, the maximum and minimum capacitance exhibited by said varactor diode being such that over a certain portion of said frequency spectrum the magnitude of a received broadcast television signal may significantly exceed the magnitude of said DC tuning voltage; and

means limiting distortion of said received television signal whenever its magnitude substantially exceeds said DC tuning voltage by automatically back-biasing said varactor diode.

3,983,491
TELEVISION CHANNEL INDICATOR

Akiyuki Yoshisato, Soma, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Feb. 25, 1975, Ser. No. 553,071
Claims priority, application Japan, Mar. 1, 1974, 49-24583
Int. Cl.² G01R *23/14*
U.S. Cl. 325—455 **5 Claims**



1. An indicator for a heterodyne receiver arranged to selectively receive a plurality of electromagnetic signals at frequencies respectively designated by numbers which are proportional to the local oscillator frequencies for the respective signals, the indicator comprising:

computing means connected to the local oscillator of the receiver to compute, based on the local oscillator frequency, the number corresponding to the signal selected by the receiver,

said computing means comprising a counter to count the number of oscillations of the local oscillator during a predetermined period of time so that the final count of the counter contains the number corresponding to the selected signal;

the computing means further comprising a frequency divider connected between the local oscillator and the counter;

at least three mixers each connected between the local oscillator and the counter and at least three fixed frequency oscillators each connected to one of the mixers, each of the mixers feeding to the counter a signal having a frequency equal to the difference between the local and its respective fixed frequency oscillator frequencies; and

display means connected to the computing means to display the number.

3,983,492
FREQUENCY SCAN AND LOCK CIRCUIT FOR MOBILE RADIO CHANNEL SELECTION

Reed Edward Fisher, Parsippany-Troy Hills Township, Morris County, N.J., and Robert William Humes, Martinsville, Ind., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 29, 1975, Ser. No. 544,961
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976
Int. Cl.² H04B *1/32*
U.S. Cl. 325—468 **5 Claims**

1. A mobile radio telecommunication unit having a tunable receiver and a circuit for ascertaining which one of predetermined receivable frequency channels is strongest, said circuit comprising

first and second analog signal sample and hold circuits,

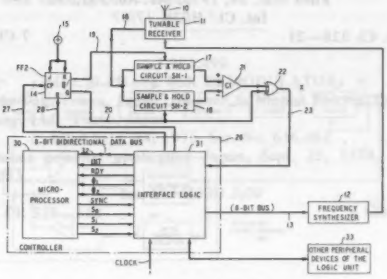
controllable means for steering an output, which is indicative of received signal strength in one of said channels, of said receiver to one or the other of said sample and hold circuits,

means for comparing outputs of said sample and hold circuits,

means, responsive to an output of said comparing means, for producing a signal pulse state when a new channel sample is the larger of two compared samples and a signal no-pulse state when the new sample is the smaller of the two compared samples, and

control means comprising

means for sequentially tuning said receiver to each of said channels,



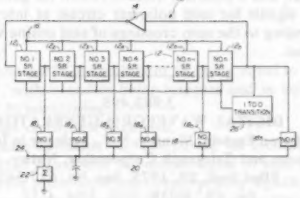
means, responsive to said pulse state, for storing the name in said sequence of said channel having said larger sample, and

means for controlling said steering means to steer each sequential channel sample from said receiving means to the one of said sample and hold circuits that held said smaller sample of two previously compared samples.

3,983,493
DIGITAL SYMMETRIC WAVEFORM SYNTHESIZER

Jerry M. Gladstone, Santa Rosa, Calif., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed June 27, 1975, Ser. No. 590,991
Int. Cl.² H03K *23/08, 14/02;* **G11C** *19/28;* **G06G** *7/28*
U.S. Cl. 328—14 **5 Claims**



1. A digital generator for producing an analog waveform including:

a. an *n* stage clocked shift register having an inverter coupled between the output of the *n*th stage and the input of the first stage, the logic state of any stage being shifted to an adjacent stage in the direction from the first stage to the *n*th stage at a rate related to the clock signal,

b. means responsive to a first logic level of each shift register stage for generating up to *n* preselected weighted currents, and responsive to a second logic level of each shift register stage for generating no current,

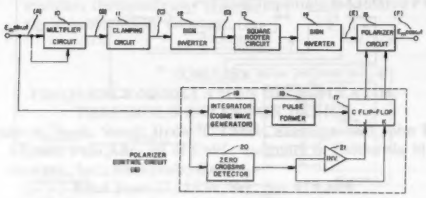
c. means for summing the preselected weighted currents to produce an analog voltage waveform whose shape is related to the sum of the preselected weighted output currents, and

d. means responsive to the output of the *n*th stage for resetting each stage of the shift register to the second level when the *n*th stage changes from the first level to the second level to insure that each shift register stage at said change is at the second level.

3,983,494
FREQUENCY INSENSITIVE SINE WAVE-TO-COSINE WAVE CONVERTER

Bimal K. Bose, Troy, and Paul M. Espelage, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 24, 1975, Ser. No. 561,592
Int. Cl.² H03K 17/07
U.S. Cl. 328—21 **7 Claims**



1. A frequency insensitive sine wave-to-cosine wave converter based on the relationship $\cos \omega t = \sqrt{1-\sin^2 \omega t}$ comprising

first circuit means for continuously multiplying a variable frequency sine wave input signal by itself to generate a first signal representative of the square $\sin^2 \omega t$,

second circuit means for effectively level shifting said first signal to generate a second signal representative of the difference $1-\sin^2 \omega t$, and

third circuit means for effectively taken the square root of said second signal to generate a cosine wave output signal with an amplitude proportional to the input signal amplitude,

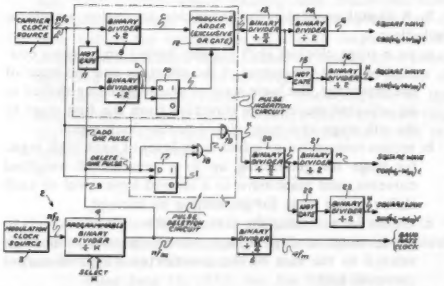
said second circuit means being comprised by a clamping circuit and a sign inverter circuit, and

said third circuit means being comprised by a square rooter circuit for generating a full wave rectified cosine wave, a polarizer circuit for converting said full wave rectified cosine wave to the alternating voltage cosine wave output signal, and a polarizer control circuit for generating control signals for said polarizer circuit at intervals corresponding to the zero crossings of said cosine wave output signal.

3,983,495
DIGITAL WAVEFORM GENERATOR

Marvin Aaron Epstein, Monsey, N.Y., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Sept. 29, 1975, Ser. No. 617,545
Int. Cl.² H03K 5/08, 3/04, 1/12
U.S. Cl. 328—34 **22 Claims**



1. A digital waveform generator to generate $\cos(w_o + w_m)t$, $\sin(w_o + w_m)t$, $\cos(w_o - w_m)t$ and $\sin(w_o - w_m)t$ square wave waveforms comprising:

a first source to provide a first square wave pulse stream having a first given frequency;

a second source to provide a second square wave pulse stream having a second given frequency less than said first given frequency;

first means coupled to said first and second sources to periodically insert one additional pulse into said first pulse stream to provide a first resultant pulse stream;

second means coupled to said first and second sources to periodically delete one pulse from said first pulse stream to provide a second resultant pulse stream;

third means coupled to said first means to divide said first resultant pulse stream by a first given division factor;

fourth means coupled to said third means to divide said divided first resultant pulse stream by a factor of two to generate said $\cos(w_o + w_m)t$ waveform;

fifth means coupled to said third means to divide the complement of said divided first resultant pulse stream by a factor of two to generate said $\sin(w_o + w_m)t$ waveform;

sixth means coupled to said second means to divide said second resultant pulse stream by a second given division factor;

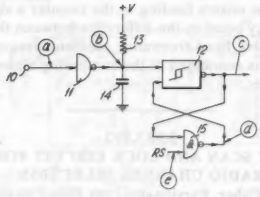
seventh means coupled to said sixth means to divide said divided second resultant pulse stream by a factor of two to generate said $\cos(w_o - w_m)t$ waveform; and

eighth means coupled to said sixth means to divide the complement of said divided second pulse stream by a factor of two to generate said $\sin(w_o - w_m)t$ waveform.

3,983,496
PULSE CIRCUITS

John Bedford, Gorebridge, Scotland, and John Alexandre Sherrington, Camberley, England, assignors to Ferranti, Limited, Hollinwood, England

Filed Apr. 15, 1975, Ser. No. 568,200
Claims priority, application United Kingdom, Apr. 16, 1974, 16609/74
Int. Cl.² H03K 5/20
U.S. Cl. 328—110 **13 Claims**

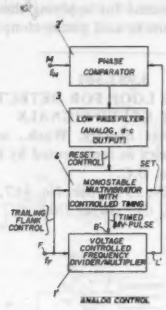


1. A high-speed pulse detection circuit comprising an input terminal to which a pulse may be applied, input means connected to the input terminal for providing a short discharge time when a pulse is applied to the input terminal and a long charge time when the pulse is terminated, a Schmitt trigger stage having a first and a second input and an output, said first input being connected to said input means, a second stage having a reset input, an input connected to said output of the Schmitt trigger stage and an output connected to said second input of the Schmitt trigger stage, and means connected to the output of the Schmitt trigger stage, the Schmitt trigger stage and the second stage forming a bistable loop which is set to one stable state by the application of a pulse to the input terminal of a duration sufficient to provide a voltage at said first input equal to a first threshold level of the Schmitt trigger stage, and is reset to the other stable state on the application of a pulse to the reset input of the second stage which allows the input of the Schmitt trigger stage to reach a second threshold level.

3,983,497
PHASE LOCKED LOOP

Wilhelm Hegeler, Hildesheim, Germany, assignor to Blaupunkt-Werke GmbH, Hildesheim, Germany

Filed Mar. 10, 1975, Ser. No. 557,040
Claims priority, application Germany, Mar. 21, 1974, 2413604
Int. Cl.² H03B 3/04
U.S. Cl. 328—155 4 Claims



1. A phase locked loop comprising

a phase comparator (2) having a signal input (M) to which an input signal (f_M) is applied and a comparison input (L) to which a comparison signal (f_L) developed within the phase locked loop is applied, and a comparison output having a comparison output signal appear thereon which is representative of the relative phase position of the signals applied to said inputs (M, L);

and a controllable frequency divider/multiplier (1) having a control input (B) to control the division/multiplication ratio (a) thereof in accordance with the comparison output signals applied to said control input (B);

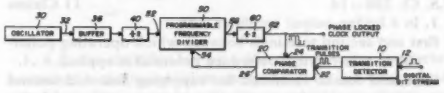
a fixed reference frequency (f_F) being applied to said divider/multiplier (1), the divider/multiplier providing an output frequency (f_L), said output frequency (f_L) forming said comparison signal being applied to the phase comparator (2), said output frequency (f_L) being representative of the reference frequency divided by the division/multiplication ratio (a) of the frequency divider/multiplier;

the output signal of said phase comparator (2) being connected to, and controlling the control input (B) of said frequency divider/multiplier (1) to control the division/multiplication ratio (a) thereof.

3,983,498
DIGITAL PHASE LOCK LOOP

Charles John Malek, Berwyn, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 13, 1975, Ser. No. 631,785
Int. Cl.² H03B 3/04
U.S. Cl. 328—155 20 Claims



1. A means for processing a digital bit stream and generating a signal in phase lock therewith comprising:

means for producing a defined pulse at each data stream transition;

means for producing a reference frequency signal;

means for frequency dividing said reference signal by a selected one of a plurality of divisors; and

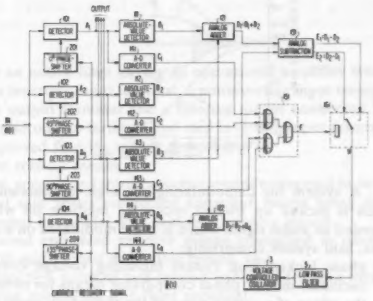
means for phase comparing said transition pulses with said divided reference signal and selecting a predetermined divisor in response thereto,

whereby said frequency divided output tends to phase lock with said digital bit stream.

3,983,499
MULTI-PHASE PSK DEMODULATOR

Yoichi Tan, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Sept. 24, 1975, Ser. No. 616,462
Claims priority, application Japan, Sept. 25, 1974, 49-110293
Int. Cl.² H03D 3/00
U.S. Cl. 329—112 4 Claims



1. An n-phase PSK demodulator (n being equal to the m-th power of 2, with n and m being integers and m equal to or larger than 3) comprising:

a. a voltage controlled oscillator;

b. $n/2$ phase-detectors for comparing an incoming PSK-modulated signal with the output signal of said oscillator to provide phase-difference-representing signals;

c. $n/2$ phase-shifters connected respectively to the output of said oscillator and the inputs of said phase detectors for shifting the phase of said oscillator output by

$$\frac{2K\pi}{n} \text{ radian } (K = 0, 1, 2, \ldots, \frac{n}{2} - 1) \ ;$$

d. $n/2$ absolute-value detecting circuits for converting the phase-difference-representing signals into absolute values, respectively;

e. means for extracting from the output signals of said absolute value detecting circuits, phase error signals mutually phase-displaced by $2\pi/n$;

f. means for analogue-to-digital converting the output signals of said phase detectors and synthesizing the converted signal; and

g. gate means for controllably switching said error signal producing means in response to said synthesized signal whereby said error signals are selectively fed to said oscillator.

3,983,500

ANGLE MODULATED WAVE DEMODULATION SYSTEM

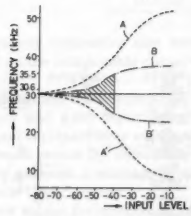
Nobuaki Takahashi, Yamato; Kazunori Nishikawa, Fujisawa; Yoshiki Iwasaki, Yokohama; Masaaki Satoh, Yokohama; Katsuhiro Ohba, Yokohama; Shinji Nakamura, Minamiashigara; Tatsuo Sawada, Sagamihara; Nobuhide Ohsaki, Yokohama; Yasuo Itoh, Tokyo; Nobuaki Suda, Yamato; Yasuhisa Okabe, Zama, and Hideaki Ozaki, Sagamihara, all of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Continuation of Ser. No. 294,371, Oct. 2, 1972, abandoned. This application Sept. 3, 1974, Ser. No. 502,531

Claims priority, application Japan, Oct. 5, 1971, 46-77531; Feb. 16, 1972, 47-16186; Feb. 23, 1972, 47-18109; Mar. 3, 1972, 47-22098; Apr. 6, 1972, 47-33842; Apr. 22, 1972, 47-40677; May 24, 1972, 47-51495

Int. Cl.[2] G11B *3/04, 3/74;* **H03D** *3/00*

U.S. Cl. 329—122 **4 Claims**



1. A system for demodulating an angle modulated wave which is picked up from a recording medium on which is recorded an audio signal which is angle modulated on a carrier wave, said system comprising:

a phase locked loop system including voltage controlled oscillator means; phase comparator means for comparing the phase of a carrier wave of the picked-up angle modulated wave with the phase of an oscillation signal generated by said voltage controlled oscillator means and for generating an output signal corresponding to the phase difference; time constant circuit means responsive to the phase comparator means output signal for attenuating audio frequency components more than frequency components which are lower than the audio frequency components, the audio frequency components and the frequency components being lower than the audio frequency components appearing in the output signal of said phase comparator means, the output signal of said time constant circuit means providing a demodulation of the picked-up angle modulated wave, means responsive to a feed back from the output of said time constant circuit means to said voltage controlled oscillator means to cause the oscillator output to follow the frequency of the carrier wave of the picked-up angle modulated wave, means whereby said phase locked loop system has first and second lock frequency ranges falling within the oscillation frequency of said voltage controlled oscillator means and controlled responsive to the output of said time constant means, said second lock frequency range being more narrow than the first lock frequency range, means responsive to the lower than audio frequency components for establishing said first lock frequency range and causing said voltage controlled oscillator means to follow any deviations between the frequency of the picked-up carrier wave and the frequency which the carrier wave had when it was originally recorded, and means responsive to the audio frequency components for establishing said second lock frequency range and causing said voltage controlled oscillator means to follow any audio frequency deviations of the picked-up carrier wave;

means responsive to the frequency of the carrier wave of the picked-up angle modulated wave which lies outside of said first lock frequency range for operating said voltage controlled oscillator means to oscillate at a frequency which is substantially equal to the frequency which the carrier wave had when the carrier wave was recorded on the recording medium; and

means responsive to the level of the picked-up carrier wave exceeding the frequency width where said second lock frequency range begins to saturate for adjusting the level of the picked-up carrier wave to be below a predetermined level, and means for applying the output of said level adjusting means to said phase comparator means.

3,983,501

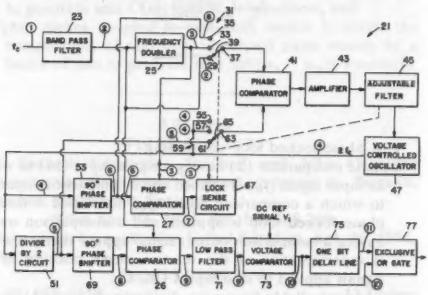
HYBRID TRACKING LOOP FOR DETECTING PHASE SHIFT KEYED SIGNALS

Alan L. Lindstrum, Port Blakely, Wash., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 29, 1975, Ser. No. 617,885

Int. Cl.[2] H03D *3/00*

U.S. Cl. 329—122 **10 Claims**



1. A detector for detecting phase shift keyed signals including a carrier signal having a frequency f_c comprising:

a. receiver means for receiving said phase shift keyed signals;

b. a phase locked loop means for locking onto said carrier signal;

c. the output of said receiver means connected to the input of said phase locked loop means;

d. control means;

e. said control means operably connected to said receiver means and said phase locked loop means for selecting one or more of a plurality of input signals to be applied to said phase locked loop means in response to the output of said receiver means and the output of said phase locked loop means.

3,983,502

BRIDGE-OUTPUT AMPLIFIER WITH DIRECT-COUPLED DIFFERENTIAL-MODE FEEDBACK

Carl Franklin Wheatley, Jr., Somerset, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 363,630, May 24, 1973, abandoned. This application Feb. 27, 1975, Ser. No. 553,634

Int. Cl.[2] H03F *1/34, 3/213, 3/26*

U.S. Cl. 330—14 **11 Claims**

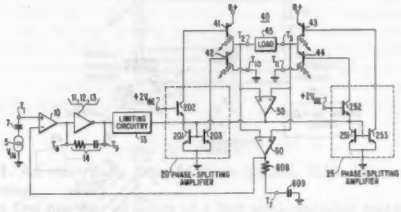
1. In a bridge-output amplifier with

first and second terminals between which operating potential as referred to a reference potential is applied;

third and fourth terminals for supplying first and second output signals for application to respective ends of a floating load;

means for generating an error signal responsive to the difference between an input signal potential referred to said reference potential and the signal appearing between said third and said fourth terminals; and

first, second, third and fourth transistor means arranged for substantially Class B operation, the principal conduction path of the first being connected between said first and third terminals, of the second between said third and second terminals, of the third between said first and fourth terminals, of the fourth between said fourth and second terminals, the connection of their principal conduction paths forming a bridge, said first and fourth transistor means conducting in response to positive swings of said error signal, said second and third transistor means conducting in response to negative swings of said error signal;



improved means for adjusting the balance of the bridge for quiescent potentials at said third and fourth terminals comprising:

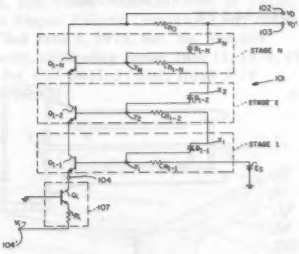
a difference amplifier having inverting and non-inverting input terminals connected respectively to said third terminal for receiving said first output signal and to said fourth terminal for receiving said second output signal, and having an output terminal for providing a feedback signal in response to the difference in potential between its input terminals; and

means for applying at least a portion of the quiescent component of said feedback signal as a component of said error signal.

3,983,503
HIGH VOLTAGE AMPLIFIER

Lawrence H. Bannister, Dedham, and Richard H. Baker, Bedford, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Sept. 23, 1974, Ser. No. 508,293
Int. Cl.² H03F 3/42
U.S. Cl. 330—18 **6 Claims**

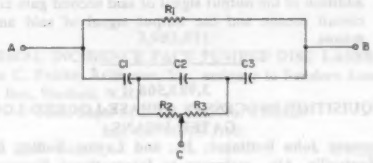


1. A linear amplifier having a plurality of stages connected in cascade including an input and an output stage, each of said stages including a transistor having an emitter, a collector and a base, said emitter and collector forming a series circuit between adjacent stages of the cascade, and a bias circuit connected to the base, each bias circuit including a bias resistor through which bias voltage is applied to the base and a separate source of bias potential connected to the bias resistor, the source of bias potential connected to the bias resistor of the input stage being a primary source of voltage while each of the other sources of bias potential is interconnected between the base and the bias resistor of the next succeeding stage.

3,983,504
ACTIVE FILTER

Franklin Moy, 2038 Cunningham Drive, Hampton, Va. 23666

Filed Nov. 21, 1975, Ser. No. 627,303
Int. Cl.² H03F 1/36
U.S. Cl. 330—107 **9 Claims**



1. In an active filter having an operational amplifier means with an inverting input terminal, a noninverting input terminal and an output terminal and a filtering means connected between said output terminal and said inverting input terminal, the improved filtering means comprising:

a first resistor means;

a first, second and third capacitor means connected in series and said series connected capacitor means being connected in parallel with said first resistive means;

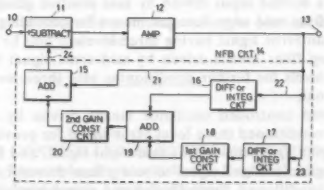
a second and third resistive means connected in parallel with said second capacitive means; and

the junction point of said second and third resistive means being connected to a fixed potential.

3,983,505
SIGNAL FREQUENCY BAND CONTROL SYSTEM

Yukinobu Ishigaki, Yamato, and Takaro Mori, Yokohama, both of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Apr. 8, 1975, Ser. No. 566,072
Claims priority, application Japan, Apr. 10, 1974, 49-41424; Apr. 15, 1974, 49-40891; Apr. 22, 1974, 49-44423; Apr. 22, 1974, 49-44424
Int. Cl.² H03F 1/36
U.S. Cl. 330—107 **14 Claims**



1. A signal frequency band control system comprising:

amplifier means for amplifying input signals having a certain frequency band;

first differentiation circuit means responsive to an output signal of said amplifier means for providing a primary differentiation;

second differentiation circuit means responsive to the output signal of said amplifier means for providing a secondary differentiation;

first gain constant circuit means for multiplying the output signal of said second differentiation circuit means by a first gain constant K1;

adding means for adding the output signals of said first differentiation circuit means and of said second differentiation circuit means after being multiplied by the first gain constant K1;

second gain constant circuit means for multiplying the output signal of said adding means by a second gain constant K2 which is variable;

control means for varying the second gain constant K2 to control the cut-off frequency of the frequency band of the output signal of said amplifier means; and

feedback means for negatively feeding back to an input of said amplifier means a sum signal resulting from the addition of the output signal of said second gain constant circuit means and the output signal of said amplifier means.

3,983,506

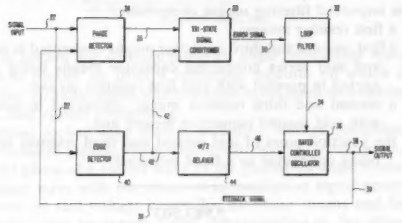
ACQUISITION PROCESS IN A PHASE-LOCKED-LOOP BY GATED MEANS

Lawrence John Rettinger, Jr., and Layton Balliet, both of Huntsville, Ala., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 11, 1975, Ser. No. 595,250

Int. Cl.² H03B 3/04

U.S. Cl. 331—17 **1 Claim**



1. A phase-locked-loop circuit configuration for improving the acquisition process comprising:

phase detector means for comparing the phase between an input signal and a feedback signal providing at its output an error signal proportional thereto;

edge detector means driven by said input signal for detecting the positive edge thereof providing at its output a positive going step signal;

tri-state signal conditioner means having a first input driven by said error signal from said phase detector means, and a second input driven by said positive going step signal from said edge detector means for providing at is output an error signal having three levels;

loop filter means driven by said error signal having three levels for further conditioning said three level error signal;

gated controlled oscillator means driven by said further conditioned three level error signal for providing an output signal that tracks said input signal, and for providing said feedback signal to said phase detector, said further conditioned three level error signal biasing said gated controlled oscillator at a point which enables said gated control oscillator to be turned on at the frequency of said input signal and at the stable null $\pi/2$ when a gating signal is present;

$\pi/2$ delayer means driven by said positive going step voltage from said edge detector means for delaying thereof, said delayed positive going step signal gating said gated controlled oscillator on;

said gated controlled oscillator locking up at said stable null $\pi/2$ and at said frequency of said input signal and eliminating the statistical nature of said acquisition process and decreasing the lock-up-time of the loop.

3,983,507

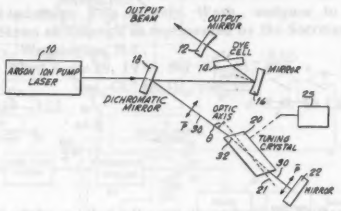
TUNABLE LASER SYSTEMS AND METHOD

Chung-Liang Tang, and John M. Telle, both of Ithaca, N.Y., assignors to Research Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 538,585, Jan. 6, 1975, abandoned. This application Jan. 13, 1975, Ser. No. 540,435

Int. Cl.² H01S 3/10

U.S. Cl. 331—94.5 M **10 Claims**



1. In a tunable laser having a tunable laser cavity, the improvement which comprises:

a birefringent tuning crystal disposed in the laser light path within the cavity and having an end surface through which the optic axis of the crystal projects; and

means for positioning the crystal with said light path incident upon said crystal end surface and the optic axis of the crystal at selected small acute angles to the direction of the laser light path through the crystal, to tune the laser to selected wavelengths.

3,983,508

LASERS

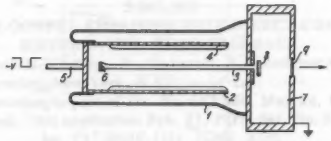
Daniel Joseph Bradley, London, and Marcus Henry Ritchie Hutchinson, Harrow, both of England, assignors to National Research Development Corporation, London, England

Filed Mar. 19, 1975, Ser. No. 559,751

Claims priority, application United Kingdom, Mar. 29, 1974, 14102/74

Int. Cl.² H01S 3/097

U.S. Cl. 331—94.5 PE **4 Claims**



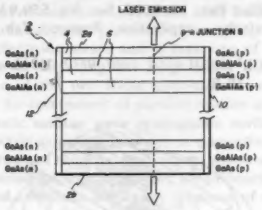
1. A laser comprising a field-emission diode of annular configuration defined between an outer cathode and an inner anode coxial therewith, which anode is in the form of a hollow container for a high pressure gaseos lasing medium, the walls of the container being at least partly pervious to electrons emitted from the cathode, mirrors at opposite ends of the container to enable resonance to occur therein at the lasing frequency, and means for abstracting energy at the lasing frequency from the container.

3,983,509

DISTRIBUTED FEEDBACK DIODE LASER

Donald R. Scifres, and Robert D. Burnham, both of Los Altos, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 25, 1975, Ser. No. 572,475
Int. Cl.² H01S 3/19
U.S. Cl. 331—94.5 H 6 Claims



1. An electrically pumped multi-layered, diode laser comprising:

a first plurality of layers of a first semiconductor material,

a second plurality of layers of a second semiconductor material,

said first and second semiconductor materials having different indices of refraction and different bandgaps, said second plurality of layers being interleaved with said first plurality of layers such that alternate layers of said laser are of different semiconductor material,

each of said plurality of interleaved layers having a thickness t according to the relationship $t = m\ \lambda/2n$ where m is an integer equal to the mode of the laser oscillations, λ is the wavelength of the light photons generated in the first plurality of layers when they are electrically pumped, and n is the refractive index of the material of said each layer,

a rectifying junction extending through at least said first plurality of layers, and

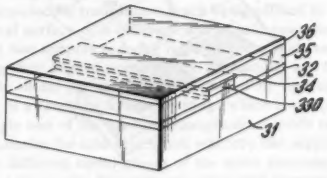
means for electrically pumping said first plurality of layers to produce said light photons of said wavelength whereby said light photons are coupled and reinforced in phase by said second plurality of layers to thereby provide a coherent output beam.

3,983,510

SEMICONDUCTOR DOUBLE HETEROSTRUCTURE LASER DEVICE AND METHOD OF MAKING THE SAME

Izuo Hayashi, and Yasuo Nannichi, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed June 6, 1975, Ser. No. 584,405
Claims priority, application Japan, June 11, 1974, 49-66733
Int. Cl.² H01L 21/208; H01S 3/19
U.S. Cl. 331—94.5 H 6 Claims



1. A method of making a stripe-geometry semiconductor double-heterostructure laser device comprising the steps of:

a. providing an n-GaAs substrate;

b. liquid-epitaxially growing a first layer of n-$Al_zGa_{1-z}As$ on one surface of said substrate;

c. epitaxially growing a second layer of p-$Al_yGa_{1-y}As$ on said first layer;

d. forming a third layer of heat- and Ga melt-resistant material of narrow stripe geometry on said second layer; and

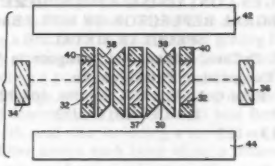
e. bringing a gallium melt liquid of a composition to be formed into a fourth layer of n-$Al_xGa_{1-x}As$ on said second layer into contact with said second and third layers, said second layer except for the area coated with said third layer, and part of said first layer in the thickness direction being meltbacked by Ga melt liquid, and then forming said fourth layer by epitaxial growth techniques.

3,983,511

NORMAL INCIDENCE FACE PUMPED DISC LASER

William C. Fricke, Arlington, Va., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Sept. 8, 1975, Ser. No. 610,969
Int. Cl.² H01S 3/06
U.S. Cl. 331—94.5 P 6 Claims



1. A laser device, comprising:

a laser cavity;

at least one disc of active laser medium arranged normal to the axis of laser radiation;

pumping means for emitting radiation of pumping wavelengths; and

means for refracting said pumping radiation onto at least one face of said laser disc.

3,983,512

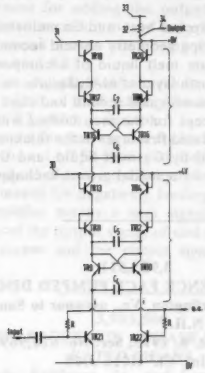
CURRENT CONTROLLED ELECTRICAL CIRCUITS

William Mark Lipscombe, Haywards Heath, England, assignor to Feedback Instruments Limited, England

Filed Aug. 22, 1975, Ser. No. 606,764
Claims priority, application United Kingdom, Aug. 27, 1974, 37397/74
Int. Cl.² H03B 5/24
U.S. Cl. 331—108 B 17 Claims

1. A resonant circuit including a plurality of balanced phase shift circuits connected in series, a pair of transistors interconnected by a capacitor defining one of said phase shift circuits, and control means connected in series with the phase shift circuits for supplying balanced direct currents to the balanced

phase shift circuits, wherein the control means is effective to define the direct current flowing through the transistors, the



emitter resistance of the transistors and hence the frequency of oscillation of the circuit.

3,983,513

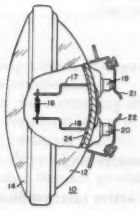
INCANDESCENT LAMP HAVING A HALOGEN-CONTAINING ATMOSPHERE AND AN INTEGRAL REFLECTOR OF NON-REACTIVE SPECULAR METAL

Aristide R. DeCaro, Edison, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 18, 1973, Ser. No. 407,727

Int. Cl.² H01K *1/32*

U.S. Cl. 313—113 **14 Claims**



1. A halogen-cycle reflector type electric incandescent lamp that has a predetermined rated life, said lamp comprising;

a sealed envelope of light-transmitting material that contains (*a*) an atmosphere which consists essentially of an inert fill gas and a halogen and (*b*) a filament which consists essentially of tungsten and is thus adapted, when energized, to coact with said halogen and establish a regenerative cycle within the lamp during operation thereof that returns vaporized tungsten to said filament,

lead-in conductors extending into said envelope and electrically connected to said filament, the portions of said conductors that are exposed to said halogen being composed of a material that is substantially inert with respect to the halogen, and

reflector means disposed on and integral with a selected portion of said envelope, said reflector means consisting essentially of a thin specular coating of a metal that withstands both the atmosphere and temperatures to which it is exposed when the lamp is energized and operated so that the specular metal coating thereby retains its light-reflective property and serves as an integral reflector throughout the rated life of the lamp.

3,983,514

SURFACE ACOUSTIC WAVE DEVICE AND METHOD OF MANUFACTURING SAME

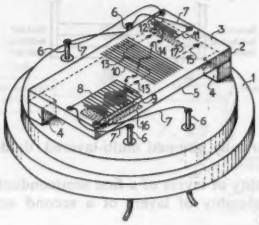
Gérard Coussot, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Feb. 14, 1975, Ser. No. 550,035

Claims priority, application France, Feb. 15, 1974, 74.05204

Int. Cl.² H03H *9/26, 9/30, 9/32*; H01L *41/10*

U.S. Cl. 333—30 R **5 Claims**



1. Surface acoustic wave device comprising a piezo-electric wafer having two main faces opposite one another and two sets of interdigitated comb shaped electrodes lying on one of said main faces, said sets respectively forming a launching and a receiving transducer, said device further comprising on said one main face surface acoustic wave coupling means positioned between said transducers for causing the surface acoustic waves to follow within said one main face a path including a step, the other of said main faces comprising at least one ground zone facing at least one of said sets for scattering the bulk acoustic waves travelling across the thickness of said piezo-electric wafer.

3,983,515

ACOUSTIC SURFACE WAVE DEVICES

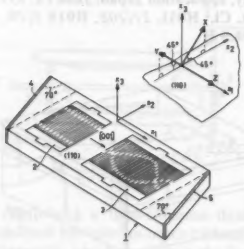
Richard Frank Mitchell, Kingston; Eileen Read, High Wycombe, and Richard Stevens, Copthorne, all of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 10, 1974, Ser. No. 513,701

Claims priority, application United Kingdom, Oct. 12, 1973, 47743/73; Oct. 12, 1973, 47744/73

Int. Cl.² H03H *9/26, 9/30, 9/32*; H01L *41/18*

U.S. Cl. 333—30 R **17 Claims**



1. A method of manufacturing an acoustic surface wave device comprising the steps of forming a monocrystalline body of a selected piezoelectric substance, forming a planar acoustic surface wave propagation surface on said body oriented in

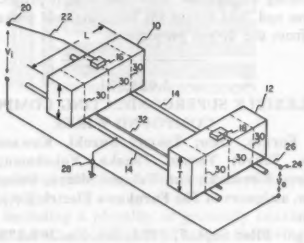
a selected manner with respect to the crystallographic axes of said monocrystal, and applying launching and receiving interdigital electrode arrays to said acoustic surface wave propagation surface respectively to launch and to receive acoustic surface waves along a selected acoustic surface wave propagation axis on said surface so as to provide a desired amplitude-frequency response, said piezoelectric substance and the orientation of said respective acoustic surface wave propagation surface and axial propagation direction relative to the crystallographic axes of said monocrystalline body being selected to provide substantially zero piezoelectric coupling between said interdigital electrode arrays and at least one of the group of axial-bulk-waves including the longitudinal axial-bulk-wave and that one of the two shear axial-bulk-waves which has substantially no component of particle motion at right angles to said acoustic surface wave propagation surface, whereby the piezoelectric coupling between a respective interdigital electrode array and the axial-bulk-waves which are generated thereby are small enough to prevent a significant disturbance of the desired amplitude-frequency response of the device.

3,983,516

LONGITUDINAL-MODE MECHANICAL BANDPASS FILTER

Robert A. Johnson, Tustin, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 25, 1975, Ser. No. 607,725
Int. Cl.² H03H *9/04, 9/26*
U.S. Cl. 333—71 **5 Claims**



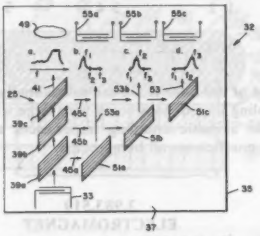
1. A mechanical bandpass filter, comprising:
at least two bar resonators, aligned in parallel array along their longitudinal axes;
two piezoelectric transducers, each being affixed to a longitudinal surface of a different one of said resonators;
at least two support rods for rigidly joining said resonators along their aligned nodal planes, the number and location of the nodal planes being determined by operating the filter in a bandpass frequency range which corresponds to a single one of the harmonic longitudinal-mode resonant frequencies for said resonators whereby the support rods lie in different nodal planes of the same resonator;
coupling means for flexurally coupling said resonators;
means for applying an electrical input signal to one of said transducers for mechanically driving its associated resonator, and
means for extracting an electrical output signal from the other one of said transducers.

3,983,517

SURFACE ACOUSTIC WAVE MULTI-CHANNEL FILTER

Rolf D. Weglein, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 20, 1974, Ser. No. 534,991
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976
Int. Cl.² H03H *9/26, 9/30, 9/32;* **H01L** *41/08*
U.S. Cl. 333—72 **7 Claims**



1. A surface acoustic wave multi-channel filter, comprising:
a substrate having a surface capable of supporting propagating surface acoustic wave energy;
input transducer means disposed on said substrate surface for converting electrical input energy to surface acoustic wave energy in said substrate and propagating said energy along a first predetermined path;
periodic grating filter means disposed on said substrate and including a first set of spaced periodic grating filter arrays tandemly positioned in said first predetermined path each for reflecting a portion of the propagating surface acoustic wave energy incident thereon along a separate predetermined intermediate path skew to said first predetermined path, and also including a second set of periodic grating filter arrays each lying along a different one of said separate predetermined intermediate paths and each reflecting at least a portion of the propagating surface acoustic wave energy incident thereon along a separate predetermined output path skew to the associated intermediate path, each of said periodic grating filter arrays including a plurality of spaced parallel reflector elements having a fixed periodicity, said periodic grating filter arrays in each associated pair of such arrays having the same reflector element periodicity but different from the reflector element periodicity of other associated pairs of such arrays thereby providing a predetermined different frequency-selective characteristic for each said associated pairs of said periodic grating filter arrays; and
output transducer means disposed on said substrate surface and including output transducers each lying along a different one of said predetermined output paths and each converting surface acoustic wave energy incident thereon, as reflected by said associated pairs of said periodic grating filter arrays in said first and second sets, to electrical output energy having a desired different center frequency.

3,983,518

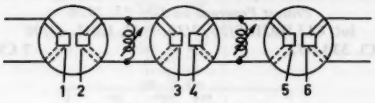
FILTER CHAIN

Jan Adrianus Bezemer, Zwijndrecht, Netherlands, assignor to De Statt der Nederlanden, te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie, The Hague, Netherlands

Filed Apr. 24, 1975, Ser. No. 571,408
Int. Cl.² H03H *9/26, 7/14;* **H04R** *17/00*
U.S. Cl. 333—70 R **8 Claims**

1. A band-pass filter chain for passing frequencies within a given frequence band comprising a plurality of monolithic filter units made of quartz or other piezoelectric material and

adapted to vibrate according to the thickness shear mode, each filter unit being provided with at least two acoustically coupled resonators, said filter units being coupled electrically so that the electric coupling impedances within the frequency



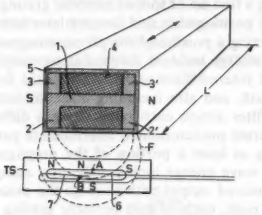
pass band of the filter chain are substantially ohmic, the electric coupling impedances being very large with respect to the equivalent acoustic coupling impedances and the acoustic coupling coefficients all being equal.

3,983,519

ELECTROMAGNET

Hans-Göran Stadigh, Undersaker, Sweden, assignor to Linden-Alimak AB, Skelleftea, Sweden

Continuation of Ser. No. 449,882, March 11, 1974, abandoned. This application Apr. 18, 1975, Ser. No. 569,424
Claims priority, application Sweden, Mar. 9, 1973, 7303335
Int. Cl.² H01H *51/28*
U.S. Cl. 335—151 **5 Claims**



1. In apparatus for generating a distinctive signal when an electromagnetic device and a magnetic responsive means are moved relative to each other into a magnetic coupling relationship wherein:

said electromagnetic device includes a ferromagnetic core of generally U-shaped cross-section which is elongated in the direction normal to said U-shaped cross-section.

and a coil wound about said core with the turns thereof encircling the bight portion of said core and lying generally parallel to the leg portions of said U-shaped core to provide when energized a magnetic field of flux lines extending between the free ends of said leg portions which field is substantially uniform over the entire length of said core,

said magnetic responsive means and said electromagnetic device being movable relative to each other in a direction parallel to that of the turns of said coil, and thus transversely to the direction of the flux lines, into and out of said magnetic coupling relationship, said magnetic responsive means when in its magnetic coupling relationship with said electromagnetic device being on the side of said U-shaped core towards which the legs of the U are directed,

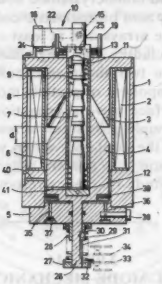
said magnetic responsive means providing said distinctive signal when said magnetic responsive means is in magnetic coupling relationship with said electromagnetic device.

3,983,520

SOLENOID ELECTROMAGNET HAVING A WIDE, CONTROLLED STROKE

Denjiro Sakata, N. 6-11, Muromachi, Ikeda, Osaka, Japan

Filed Oct. 1, 1975, Ser. No. 618,678
Claims priority, application Japan, Oct. 4, 1974, 49-115979
Int. Cl.² H01H *9/20*
U.S. Cl. 335—170 **5 Claims**



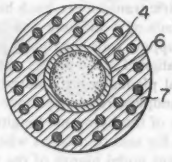
1. A solenoid electromagnet comprising a casing having an electromagnet coil, a fixed core in said casing, a moving core mounted within said casing and slidable towards and away from said fixed core, a spring urging said moving core away from said fixed core, an operation rod having thereabout plural detent projections at predetermined spaces and slidably extending into said moving core, a picker means having a radially retractile and axially fixed connection with said moving core, a catch means having a radially retractile and axially fixed connection with said fixed core, said picker and catch means being engageable with said detent projections of the operation rod, and means for releasing said picker and catch means from the detent projections.

3,983,521

FLEXIBLE SUPERCONDUCTING COMPOSITE COMPOUND WIRES

Yoshio Furuto, Oiso; Takuya Suzuki, Kawasaki; Masaru Ikeda, Tokyo; Yasuzo Tanaka, Yokohama; Shinichiro Meguro, Kawasaki, and Takeshi Miura, Yokohama, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Sept. 7, 1973, Ser. No. 395,178
Claims priority, application Japan, Sept. 11, 1972, 47-91016; Feb. 27, 1973, 48-23598; Mar. 13, 1973, 48-29303; Nov. 28, 1972, 47-119116; Oct. 13, 1972, 47-102594; Oct. 13, 1972, 47-102593; Oct. 13, 1972, 47-102592; Oct. 13, 1972, 47-102591
Int. Cl.² H01F *7/22*
U.S. Cl. 335—216 **9 Claims**



1. A superconducting compound wire which comprises a plurality of strands having a superconducting compound therein, at least some of the strands having an inclination to the lengthwise direction of the superconducting wire and the strands being movable with respect to one another, said wire

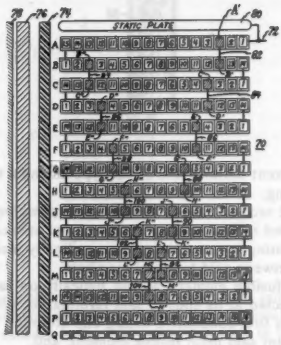
having a reinforcing material provided at least in the center portion of the superconducting wire selected from the group consisting of tungsten, molybdenum, stainless steel, glass, carbon, and alumina, in the form of a wire, and wherein the outer diameter of the strand is smaller than the product of the allowable bending diameter of the superconducting wire to be obtained and the strain limit for not degrading the superconducting characteristics of the strands and wherein the stranding pitch length of the strands is in the range of 20 to 1000 times of the strand outer diameter.

3,983,522

TAPERING ELECTROSTATIC SHIELDS FOR DISC WINDINGS

Robert E. Gearhart, Rome, Ga., assignor to General Electric Company, N.Y.

Filed Dec. 19, 1975, Ser. No. 642,579
Int. Cl.² H01F 15/14
U.S. Cl. 336—70 8 Claims



1. An electrostatic shielding device for inductive apparatus of the type having,

a winding, including a plurality of generally coaxially disposed annular disc coils, each of said coils having a plurality of insulated conductor turns, each of said conductor turns having at least one strand;

spirally wound, in the same direction, alternately radially inward and radially outward, beginning with an initial coil at one end of said winding and terminating with a final coil at the opposite end of said winding,

a finish-end of a coil being connected to a start-end of an immediately adjacent coil to form a winding connected in an electrical series circuit relation, at least the start end of said initial coil being for connection to a high potential source,

wherein the improvement comprises:

at least one electrostatic shield-conductor between turns of a plurality of spirally wound disc coils of said winding,

selected shield-conductors in some adjacent spirally wound coils being connected together in shield-conductor pairs,

said shield-conductor pairs progressing inwardly from an outer portion of said winding, shield-conductors of said inwardly progressing shield-conductor pairs being the outermost shield-conductors of the spirally wound disc coils in which they are located,

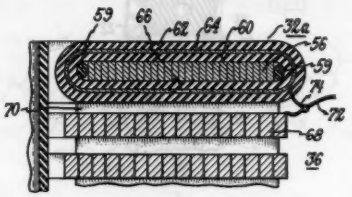
and outermost shield-conductor pair being located near a high-potential end of said winding.

3,983,523

COMBINATION STATIC PLATE AND CLAMPING RING

Ralph E. Ayers, Rome, Ga., assignor to General Electric Company

Filed Nov. 3, 1975, Ser. No. 627,901
Int. Cl.² H01F 15/04
U.S. Cl. 336—84 6 Claims



1. In electric induction apparatus of the type having,

a housing,

a magnetic core including a plurality of legs, said magnetic core being mounted internal of and in a fixed relation with respect to said housing,

a cylindrical winding having upper and lower ends incorporating a plurality of radially spaced-apart coils,

said winding being disposed around a leg of said magnetic core in an electrically insulated relationship thereto,

first clamping support structure proximate to said upper end and second clamping support structure proximate to said lower end of said winding, said first and second clamping support structure being in a fixed relation with respect to said magnetic core and said housing,

a lower force distributing member positioned between said lower end of said winding and said second clamping structure,

wherein the improvement comprises:

a. a foundation ring formed of concentrically positioned, generally circular, core-steel strips, adjacent surfaces of said core-steel strips being held together by bonding means, said foundation ring having a slot extending completely through said foundation ring in a generally radial direction;

b. electrically conductive material placed on and electrically insulated from said foundation ring, for connection to a high voltage terminal of said electrical induction apparatus; and

c. force generating means reacted between the combination of said foundation ring and said electrically conductive material, and said first clamping support structure for the applicaton of a compressive force to the upper and lower ends of said winding.

3,983,524

ELECTRICAL CURRENT LIMITING FUSE HAVING FUSIBLE ELEMENT WITH ADDITIONAL CROSS-SECTIONAL NECKS AT AN ARCING CLIP

Robert E. Koch, Pittsfield, Mass., assignor to General Electric Company, N.Y.

Filed Oct. 9, 1975, Ser. No. 621,080
Int. Cl.² H01H 85/04
U.S. Cl. 337—159 6 Claims

1. A current-limiting fuse of the type having a tubular insulating casing;

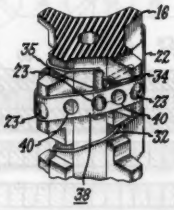
first and second conductive terminal members closing the first and second ends, respectively, of said casing;

an insulating core extending longitudinally inside said casing between said terminal members;

a main fusible element wound helically on said core and connected at its ends to said terminal members;

at least a first conductive arcing clip mounted on said core adjacent a segment of said main fusible element; and,

an auxiliary conductive element wound around said core and having one end connected to said arcing clip,



wherein the improvement comprises that:

said segment of said main fusible element is provided with cross-sectional necks which are in addition to any regularly spaced necks provided along the length of the element for high-current melting characteristics.

3,983,525

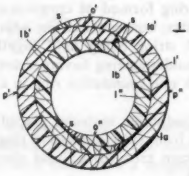
ELECTRIC FUSE AND TUBE MATERIAL ADAPTED FOR USE AS FUSE CASING

Daniel P. Healey, Jr., Merrimacport, Mass., assignor to The Chase-Shawmut Company, Newburyport, Mass.

Continuation-in-part of Ser. No. 579,972, May 22, 1975. This application June 30, 1975, Ser. No. 591,629

Int. Cl.² H01H *85/20*

U.S. Cl. 337—186 **3 Claims**



1. In an electric fuse the combination of

a. a fusible element;

b. a body of pulverulent arc-quenching filler embedding said fusible element;

c. a pair of terminal elements are arranged adjacent one of the ends of said fusible element for connecting said fusible element into an electric circuit; and

d. a tubular casing of synthetic-resin-glass-cloth laminate housing said fusible element and said filler and supporting said pair of terminal elements, said casing having a plurality of re-inforcement plies of woven glass fiber cloth excluding any non-woven mat material, each of said plurality of plies forming an overlap angularly displaced relative to said overlap of all others of said plurality of plies, the wall of said casing including first regions where the ratio of the glass-to-resin content is relatively large and the wall of said casing including second regions where the ratio of glass-to-resin content is relatively small, said first regions and said second regions alternating along the entire perimeter of said casing, so that the wall thickness of said casing is substantially uniform throughout the entire perimeter thereof.

3,983,526

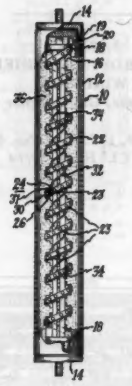
CURRENT LIMITING FUSE WITH AUXILIARY ELEMENT ARCING CLIP SPACED BY NONPOROUS DIELECTRIC MEMBER

Robert E. Koch, Pittsfield, Mass., assignor to General Electric Company

Filed Oct. 9, 1975, Ser. No. 621,079

Int. Cl.² H01H *85/38*

U.S. Cl. 337—278 **6 Claims**



1. A current limiting fuse of the type having a tubular insulating casing;

first and second conductive terminal members closing the first and second ends, respectively, of said casing;

an insulating core extending longitudinally inside said casing between said terminal members;

a main fusible element wound helically on said core and connected at its ends to said terminal members;

at least a first conductive arcing clip mounted on said core adjacent said main fusible element; and,

an auxiliary conductive element wound around said core and having one end connected to said arcing clip, the improvement therein comprising:

a non-porous dielectric member covering a major portion of the exposed surface of said first arcing clip interposed between and in physical contact with both said first arcing clip and said main fusible element.

3,983,527

HUMIDITY-SENSITIVE SENSOR

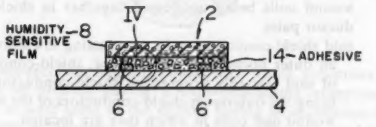
Nobuyoshi Ohsato, Itami; Kenzo Sono, Nishinomiya, and Keihachiro Tanaka, Itami, all of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Aug. 12, 1974, Ser. No. 496,856

Claims priority, application Japan, Aug. 14, 1973, 48-91449; Nov. 6, 1973, 48-124008; Dec. 26, 1973, 49-1934; Jan. 7, 1974, 49-5525; Mar. 25, 1974, 49-33697; Mar. 8, 1974, 49-27666[U]; Apr. 26, 1974, 49-48854[U]

Int. Cl.² H01C *13/00*

U.S. Cl. 338—35 **11 Claims**



1. A humidity-sensitive sensor comprising:

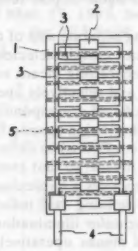
an electrically non-conductive base plate;
a pair of spaced electrodes fixed on said base plate;
a humidity-sensitive coating composed of a hygroscopic resin having dispersed therein electrically conductive particles and extending over said pair of electrodes; and
an adhesive layer bonding said humidity-sensitive coating to said base plate, said adhesive layer being composed of an adhesive having dispersed therein electrically conductive particles and electrically connecting each of said electrodes to said humidity-sensitive coating while electrically insulating said electrodes from each other.

3,983,528

RESISTOR NETWORK WITH ADJUSTABLE RESISTANCE VALUE

William Clyde King, Helsinki, Finland, assignor to Oy Paramic AB, Helsinki, Finland

Filed June 17, 1975, Ser. No. 587,674
Claims priority, application Finland, June 18, 1974, 1866/74
Int. Cl.² H01C *10/00*
U.S. Cl. 338—195 **3 Claims**



1. An adjustable resistance resistor network comprising a plurality of individual resistors disposed on an insulating substrate, said resistors being connected together in parallel by strips of conductive material disposed on said insulating substrate, said substrate being provided with weakened lines which extend across said strips of conductive material between each adjacent pair of resistors whereby the substrate can be broken along said weakened lines to remove at least one of said resistors to thereby adjust the resistance value of said resistor network.

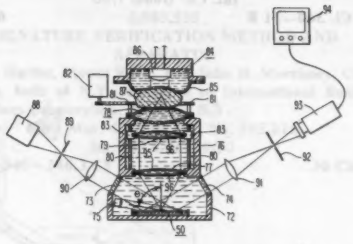
3,983,529

DETECTOR FOR USE IN ACOUSTIC HOLOGRAPHY

Gary Norris Langlois, Richland, Wash., assignor to Holosonics, Inc., Richland, Wash.

Filed Mar. 28, 1975, Ser. No. 563,123
Int. Cl.² G01N *29/04*; G01S *9/66*
U.S. Cl. 340—5 H **15 Claims**

1. Improved detector apparatus responsive to impingent acoustic wavefronts to form a hologram, comprising:
a rigid substrate having a continuous substantially planar upper surface;
a layer of liquid metal covering said planar upper surface;
said upper surface of said substrate being formed of a material which is wetted by said liquid metal;
said layer of liquid metal being thinner than the thinnest layer of said metal which could exist upon a planar surface of a material not wetted by said metal; and defining an upper surface and defining a lower surface in intimate contact with the upper surface of said rigid substrate;
a mass of a second liquid, said layer of liquid metal being submersed in said second liquid;
first transducer means positioned to direct a beam of object-modified acoustic energy through said second liquid directly onto the upper surface of said layer of liquified metal;
second transducer means positioned to direct a reference beam of acoustic energy through said second liquid directly onto the upper surface of said layer of liquid metal;



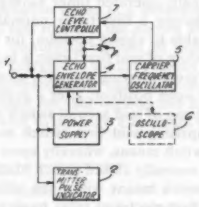
the beam from said second transducer means being oriented at a predetermined angle with respect to the beam from said first transducer means to give rise to a pattern of disturbances on said upper surface of said layer of liquid metal; and
means for directing illuminating energy upon the pattern of disturbances.

3,983,530

ECHO SIMULATING PROBE

Sverre Johannessen, Horten, Norway, assignor to Simrad A.S., Horten, Norway

Filed Mar. 7, 1975, Ser. No. 556,344
Claims priority, application Norway, Mar. 7, 1974, 801/74
Int. Cl.² G01S *7/40*
U.S. Cl. 340—5 C **12 Claims**



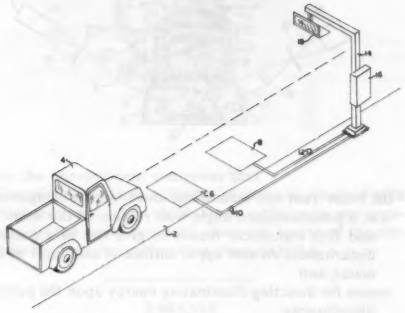
1. An echo probe for providing simulated sonar signals to test distance measuring systems measuring lapsed time between transmitted anad reflected pulses, comprising:
input/output terminal means adapted to be connected to the distance measuring equipment;
control means for producing a control signal in response to a received pulse at said input/output terminal means, said control signal including spaced first and second control signals, said first and second control signals having different characteristics from one another;
power supply means for tapping power from the pulses received at said input/output terminal means and connected to said control means; and
carrier frequency oscillator means responsive to said first and second control signals for generating simulated first and second sonar signals at said input/output terminal means and having substantially the same frequency as the carrier frequency of said distance measuring system.

3,983,531

VEHICLE-RESPONSIVE SIGNAL MEANS

Thomas B. Corrigan, Prince George, Canada, assignor to Northern Traffic & Signal Systems Ltd., Prince George, Canada

Continuation-in-part of Ser. No. 477,656, June 10, 1974, abandoned. This application Nov. 6, 1975, Ser. No. 629,296
Int. Cl.[2] G08G 1/00
U.S. Cl. 340—31 R 6 Claims



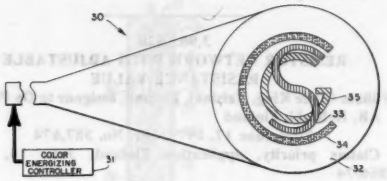
1. A vehicle-responsive signal system comprising a first, vehicle-responsive detector disposed in operative relation to a lane of a roadway and a first detector-responsive switch means coupled with said first detector; a second, vehicle-responsive detector disposed in operative relation to said lane of a roadway, positioned in measured, spaced relation to said first detector, spaced in the direction of travel of vehicular traffic in said lane of a roadway, and a second, detector-responsive switch means coupled with said second detector; a first, electrically operated timer having a predetermined time cycle and having a first timer normally open, switch blade means movable to closed position, for its timed cycle period, upon energizing of said first timer; a second, electrically operable switch means having normally closed switch blade means movable to open position, after a predetermined time delay, upon energizing of said second switch means; a first electrical circuit comprising said first switch means, and said second electrical switch means, whereby upon energizing of said first circuit said normally closed switch blade means of said second electrical switch means will move, after time delay, to open position; a first electrical relay having normally open switch blade means; a second electrical circuit comprising said switch blade means, when closed, of said second electrical switch means, and said first timer, whereby said first circuit is controlled by the operation of said first switch means, and said second circuit to said timer may move to closed position only when said switch blade means of said second switch means is in its normally closed position; a first holding circuit for maintaining said first timer energized, comprising switch blade means, when closed, of said electric relay, and said switch blade means of said first timer; a second holding circuit for maintaining said electrical relay energized comprising said switch blade means of said first timer, the electrical relay, and the switch blade means of said electrical relay, whereby said first timer, after being energized, will remain energized until its switch blade means opens; a third electrical circuit including therein switch means closing in response to closing of said first timer switch means and other switch means closing in response to closing of said second detector switch means; and an electrically controlled signal means responsive to the operation of said third electrical circuit.

3,983,532

TRAFFIC CONTROL SIGNAL APPARATUS

Royce Hayes, 2785-A Shallowford Road, Chamblee, Ga. 30341

Continuation-in-part of Ser. No. 441,638, Feb. 11, 1974, Pat. No. 3,870,991. This application Dec. 26, 1974, Ser. No. 536,343
Int. Cl.[2] G08G 1/00
U.S. Cl. 340—41 R 4 Claims



1. Traffic control signal apparatus, comprising:

CRT means positioned in signal display relation to a traffic path;

said CRT means including separate sets of color phosphors corresponding to at least certain selected traffic control colors, and phosphor energizing means corresponding to said sets of phosphors and selectively operative for light-emitting energization of said corresponding phosphors;

one of said sets of phosphor being missing from a predetermined region which is configured to define a traffic signal indicium on said CRT means, so that energization of said one set of phsophor produces a particular color illumination surrounding and defining said indicium by the absence of said particular color illumination; and

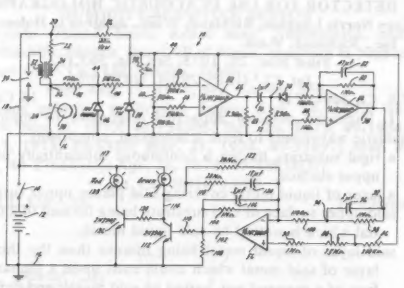
color energizing control means operatively connected to supply said phosphor energizing means of said CRT means with input signals to selectively energize certain ones of said traffic control colors.

3,983,533

MOTOR VEHICLE FUEL ECONOMY INDICATING CIRCUIT

Kurt A. Goszyk, Westland, and Richard A. Schaefer, Ann Arbor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed June 19, 1975, Ser. No. 588,442
Int. Cl.[2] G08B 21/00
U.S. Cl. 340—52 R 14 Claims



1. In combination with a motor vehicle having a drive train including an engine, a fuel economy indicating circuit for indicating to the operator of said vehicle that said engine is operating under conditions likely to produce poor fuel economy, said fuel economy indicating circuit comprising:

first circuit means for generating a first electrical signal, said first electrical signal having a magnitude proportional to the angular velocity of a component of said vehicle drive train;

second circuit means for generating a second electrical signal, said second electrical signal having a magnitude proportional to the angular acceleration of a component of said vehicle drive train;

third circuit means for combining said first and second electrical signals, thereby, to generate a third electrical signal, said third electrical signal having a magnitude that is a function of the magnitudes of said first and second electrical signals;

an electrically-actuable indicating device positioned in or on said vehicle for ready observation by an operator of said vehicle; and

fourth circuit means, responsive to said third electrical signal, for actuating said indicating device when the magnitude of said third electrical signal reaches a predetermined threshold level.

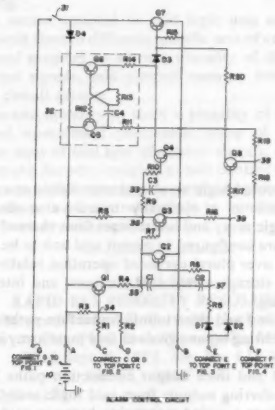
3,983,534
VEHICLE ALARM

James R. Goodman, 209 Linda Lane, Euless, Tex. 76039

Filed Mar. 17, 1975, Ser. No. 559,131

Int. Cl.² B60R *25/10*

U.S. Cl. 340—63 **10 Claims**



1. An alarm control circuit for use with a vehicle having a battery, an ignition switch circuit including an on-off switch for determining respective closed and open conditions of said ignition switch circuit, a closure operated switch circuit including an on-off switch for determining respective closed and open conditions of said closure switch circuit, and an alarm device; said alarm control circuit comprising

an output circuit including a transistor switch for energizing said alarm device;

a signal generator circuit for generating a control signal, said signal generator circuit being coupled to the base of said output circuit transistor switch;

diversion circuit means including a normally closed switch, for diverting said signal generator circuit control signal to effect shut-off of said output circuit transistor switch; closure control circuit means, including a terminal for connection to a vehicle closure switch; ignition control circuit means including a terminal for connection to the vehicle ignition switch circiut; said alarm control circuit being responsive to the open condition of said closure switch circuit and the open condition of said ignition switch circuit to maintain said diversion circuit switch closed; and said alarm control circuit being responsive to the closed condition of said closure switch circuit and the open condition of said ignition switch circuit to effect the opening of said diversion circuit switch; and the opening of said diversion circuit switch effecting the closing of said output circuit transistor switch to effect energization of said alarm device.

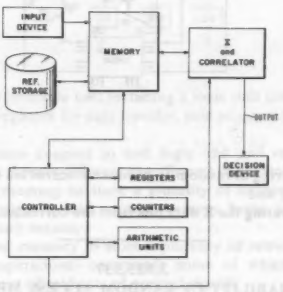
3,983,535
SIGNATURE VERIFICATION METHOD AND APPARATUS

Noel M. Herbst, Mount Kisco, and John H. Morrissey, Chappaqua, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 4, 1975, Ser. No. 555,216

Int. Cl.² G06K *9/10*

U.S. Cl. 340—146.3 SY **30 Claims**



1. A method of signature verification which comprises producing and storing a first signal set comprising a plurality of electrical signals representative of the acceleration forces transmitted by a signer's hand to a writing instrument during the writing on a writing surface of at least one signature by a known person, producing and storing a similar second set of electrical signals by a putative signer at a different time, segmenting said two signal sets for both the known and putative signatures to facilitate identifying regions of high probable correlation, individually correlating similar regions in said two sets of acceleration representative signals, combining the correlation results obtained for said regions and utilizing this combined correlation value to produce a resultant correlation level valve.

3,983,536
DATA SIGNAL HANDLING ARRANGEMENTS

Charles Richard Telfer, Coulsdon, England, assignor to The Marconi Company Limited, Chelmsford, England

Filed July 3, 1975, Ser. No. 592,995

Claims priority, application United Kingdom, July 4, 1974, 29590/74

Int. Cl.² H04L *1/10*; G08C *25/00*

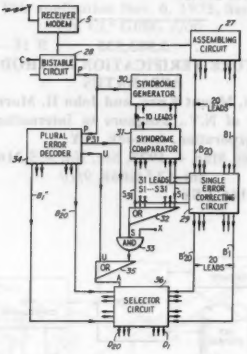
U.S. Cl. 340—146.1 AL **8 Claims**

1. A method of data handling for correcting errors arising in a transmission channel in a system in which double adjacent errors are predominant, which comprises the steps of:

a. transmitting a succession of K data bits as a codeword of N bits B_1 to B_n where $N > K$ and where the bits B_1 to B_n are related to bits P_1 to P_n of a codeword of any code capable of correcting errors occurring at random by the fact that each *i*th term P_i is equal to the cumulative sum modulo 2 of the terms B_1 to B_i and that the last bit P_n of each codeword P_1 to P_n has the same value, i.e., 0 or 1;

b. receiving the transmitted codeword and recovering therefrom the codeword P_1 to P_n or its inverse by cumulatively summing the received bits B_1 to B_n;

c. correcting for double adjacent errors introduced by the transmission of step (a) by decoding said recovered codeword according to said code capable of correcting errors



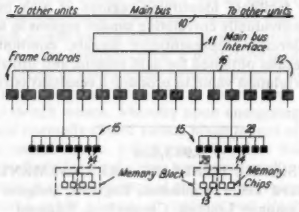
occurring at random to produce a corrected codeword B_1 to B_n; and

d. recovering the K data bits from the corrected codeword.

3,983,537
RELIABILITY OF RANDOM ACCESS MEMORY SYSTEMS

Brian Jeremy Parsons, Stevenage, and Lynne Margaret Pursell, Rayleigh, both of England, assignors to Hawker Siddeley Dynamics Limited, England

Filed Apr. 1, 1974, Ser. No. 456,647
Int. Cl.² G06F *11/00*; G11C *11/00*
U.S. Cl. 340—172.5 **8 Claims**

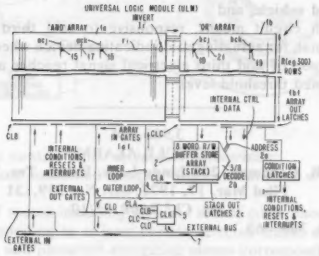


1. A digital memory system hierarchically organized with at least three levels in the hierarchy, and comprising a first level bus, a plurality of main memory units each independently interfaced to said first level bus, each main memory unit itself in turn comprising a second level bus within and respective to said main memory unit, a plurality of memory frames each independently interfaced to said second level bus, each memory frame in turn comprising a third level bus within and respective to said memory frame, and a plurality of memory storage blocks each independently interfaced to said third level bus, and wherein each said memory storage block comprises at least one storage array and is arranged for virtual addressing, said block containing means for decoding the whole of an address applied from said main bus through the several levels of the hierarchy.

3,983,538
UNIVERSAL LSI ARRAY LOGIC MODULES WITH INTEGRAL STORAGE ARRAY AND VARIABLE AUTONOMOUS SEQUENCING

John W. Jones, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 1, 1974, Ser. No. 465,783
Int. Cl.² G06F *7/00*
U.S. Cl. 340—172.5 **68 Claims**



1. Interconnected logic array and addressible storage array matrix elements in a cyclically operative modular unit, wherein the logic array and interconnections thereof with said storage array are configured to permit said unit to be operated autonomously over plural cycles of operation relative to data stored in said storage array, said elements and interconnections comprising:

first and second and third input conduction paths for cyclically presenting input signals to said logic array in parallel form;

first, second and third output conduction paths for cyclically transferring outputs from said logic array;

addressing lines coupled switchably between said first output path and address selection circuits of said storage array for selecting one of plural word locations in said storage array under control of addressing information variously shifted through said logic array;

storage write-in lines coupled switchably between said second output path and said storage array for transferring information signals from said second output path into said addressed word location for temporary storage over an arbitrary number of consecutive cycles of operation of said unit;

storage read-out lines coupled switchably between said storage array and said first input path in an INNER LOOP circuit, for transferring stored information from a said addressed location into said logic array as a partial input of a unit cycle;

means switchably connecting said second input path with said third output path in an OUTER LOOP circuit, for permitting a portion of the logic array output in one cycle of said unit to be presented as a partial input to the logic array in the next cycle; and

means connecting with said third input and output paths for providing gated external access to said logic array for conducting external input and output relative to said unit.

3,983,539

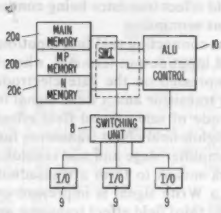
POLYMORPHIC PROGRAMMABLE UNITS EMPLOYING PLURAL LEVELS OF SUB-INSTRUCTION SETS

Ulbe Faber, Honeybrook; Robert L. Davis, Downingtown; David A. Fisher, Pittsburgh, and Joseph D. McGonagle, Media, all of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 825,569, May 19, 1969. This application July 10, 1975, Ser. No. 594,668

Int. Cl.[2] G06F *9/06*

U.S. Cl. 340—172.5 32 Claims



1. A programmable unit including a logic unit coupled to a plurality of registers for data transfer, said programmable unit comprising:

circuit means coupled to said logic unit and registers to transmit thereto different specific sets of control signals;

a control memory to store a plurality of different sets of control signals, said control memory being coupled to said circuit means;

a command memory to store a plurality of retrievable encoded operational commands some of which specify given ones of said sets of control signals; and

a command decoder coupled to said control memory and to said command memory to retrieve given ones of said specific sets of control signals to condition either said logic unit or said registers.

3,983,540

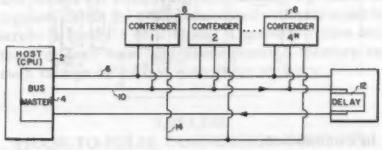
RAPID BUS PRIORITY RESOLUTION

Harry Keller, and Edward H. Forrester, both of Phoenix, Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 8, 1975, Ser. No. 611,439

Int. Cl.[2] G06F *3/00*

U.S. Cl. 340—172.5 8 Claims



1. In a computer system having a common communication bus for a plurality of contending devices all connected in parallel to said bus,

a logic circuit means at each of said contending devices, said logic circuit means each including means for establishing a priority level, and

access contention bus means connected in parallel to each of said logic circuit means,

said logic circuit means being responsive to an external signal substantially simultaneously applied to each such logic circuit means to enable a selected one of said contending devices for access to said communication bus.

3,983,541

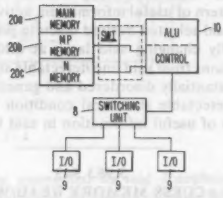
POLYMORPHIC PROGRAMMABLE UNITS EMPLOYING PLURAL LEVELS OF PHASED SUB-INSTRUCTION SETS

Ulbe Faber, Honeybrook; Robert L. Davis, Downingtown; David A. Fisher, Pittsburgh, and Joseph D. McGonagle, Media, all of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 825,569, May 19, 1969. This application July 10, 1975, Ser. No. 594,576

Int. Cl.[2] G06F *9/06*

U.S. Cl. 340—172.5 13 Claims



1. A programmable unit including a logic unit coupled to a plurality of registers for data transfer, said programmable unit comprising:

circuit means coupled to said logic unit and registers to transmit thereto different specific sets of control signals;

a control memory to store a plurality of different sets of control signals, said control memory being coupled to said circuit means;

a command memory to store a plurality of retrievable encoded operational commands some of which specifiy given ones of said sets of control signals;

a command decoder coupled to said control memory and to said command memory to retrieve given ones of said specific sets of control signals to condition either said logic unit or said registers;

clock means coupled to said command decoder to generate timing pulses representing phases during which said sets of control signals are implemented; and

addressing means coupled between said command decoder and said control memory and adapted to retrieve a set of control signals during the implementation of a previous set of control signals.

3,983,542

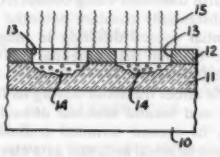
METHOD AND APPARATUS FOR RECORDING INFORMATION

Stanford R. Ovshinsky, Bloomfield Hills, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Division of Ser. No. 161,219, July 9, 1971, Pat. No. 3,868,651, which is a continuation-in-part of Ser. No. 63,404, Aug. 13, 1970, abandoned. This application Feb. 3, 1975, Ser. No. 546,299

Int. Cl.[2] G11C *13/00, 11/34*

U.S. Cl. 340—173 R 54 Claims



1. The method of recording information comprising the steps of: providing a layer of substantially disordered and generally amorphous memory material which has one struc-

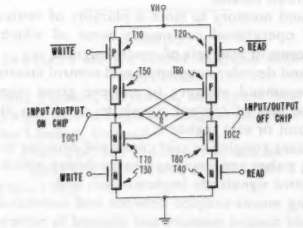
tural condition which is substantially disordered and generally amorphous and having one detectable characteristic, which is capable of having discrete portions thereof physically changed to another structural condition having another detectable characteristic, which has internal biasing forces toward said other structural condition, and which has internal inhibitions against the action of said biasing forces; providing said layer with a catalytic material which is catalytically capable of relatively increasing said biasing forces and decreasing said inhibitions against the action of said biasing forces of the memory material; and selectively, at selected desired discrete portions of the layer of memory material in accordance with a desired pattern of useful information, activating the catalytic material at said selected desired discrete portions of the layer and physically changing said layer at said selected desired discrete portions from said one detectable structural condition which is substantially disordered and generally amorphous to said other detectable structural condition to record the desired pattern of useful information in said layer.

3,983,543

RANDOM ACCESS MEMORY READ/WRITE BUFFER CIRCUITS INCORPORATING COMPLEMENTARY FIELD EFFECT TRANSISTORS

William Cordaro, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1975, Ser. No. 591,989
Int. Cl.² G11C *11/40*; H03K *3/281*
U.S. Cl. 340—173 FF **11 Claims**



1. A Read/Write buffer circuit contained on a monolithic random access memory chip and connected to the random access memory, said Read/Write buffer circuit comprising:

a first input/output terminal;

a second input/output terminal;

first, second, third, fourth, fifth, sixth, seventh and eighth field effect transistors, each of said field effect transistors having a first terminal, a second terminal and a gate electrode;

said first terminal of said first field effect transistor and said first terminal of said second field effect transistor being connected in common to a first substantially constant potential source;

said first terminal of third transistor and said first terminal of said fourth transistor being connected in common to a second substantially constant potential source, said second potential source differing in magnitude from the magnitude of said first potential by a predetermined potential difference;

said fifth field effect transistor having its first terminal connected to said second terminal of said first field effect transistor, its second terminal connected to said first input/output terminal and, said gate electrode of said fifth field effect transistor being connected to said second input/output terminal;

said sixth field effect transistor having its first terminal connected to said second terminal of said second field effect transistor, its second terminal connected to said second input/output terminal and, said gate electrode of said sixth field effect transistor being connected to said first input/output terminal;

said seventh field effect transistor having its first terminal connected to said second terminal of said third field effect transistor, its second terminal connected to said first input/output terminal, said gate electrode of said seventh field effect transistor being connected to said second input/output terminal;

said eighth field effect transistor having its first terminal connected to said second terminal of said fourth field effect transistor, its second terminal connected to said second input/output terminal, said gate electrode of said seventh field effect transistor being connected to said first input/output terminal;

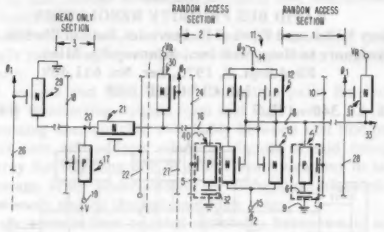
resistor means connecting said first input/output terminal to said second input/output terminal, whereby when a Read signal is impressed on the gate electrode of said fourth field effect transistor and a Read signal impressed on the gate electrode of said second field effect transistor said sixth and eighth field effect transistors function as a basic inverting amplifier stage and said resistor means functions as feedback means to form a transadmittance amplifier and when a Write signal is impressed on the gate electrode of said third field effect transistor and a Write signal is impressed on the gate electrode of said first field effect transistor said fifth and seventh field effect transistors function as a basic inverting amplifier stage and said resistor means functions as feedback means to form a transadmittance amplifier.

3,983,544

SPLIT MEMORY ARRAY SHARING SAME SENSING AND BIT DECODE CIRCUITRY

Richard Thomas Dennison, Hopewell Junction; Leo Boyes Freeman, Poughkeepsie; Helen Janet Kelly, Wappingers Falls, and Peter Tsung-Shih Liu, Wallkill, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 25, 1975, Ser. No. 607,330
Int. Cl.² G11C *7/00*
U.S. Cl. 340—173 R **8 Claims**



1. In combination,

a first array of memory cells,

a second array of memory cells,

the cells of each said array being connected along the same bit rows but along different word columns,

a plurality of actuatable switches equal to the number of said bit rows,

each bit row of said first array being selectively connectable to the same bit row of said second array upon the actuation of a respective one of said switches,

a plurality of sense amplifier means equal to said number of said bit rows,

each said amplifier means being connected to a respective bit row within said first array,

means for word addressing cells within said second array and concurrently actuating said switches, and

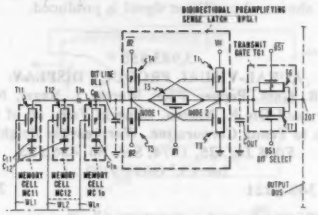
means for word addressing cells within said first array while said switches are deactuated.

3,983,545

RANDOM ACCESS MEMORY EMPLOYING SINGLE ENDED SENSE LATCH FOR ONE DEVICE CELL

William Cordaro, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1975, Ser. No. 591,988
Int. Cl.[2] G11C *11/40;* H03K *3/281*
U.S. Cl. 340—173 FF 12 Claims



1. In a monolithic memory having a plurality of groups of storage cells, each storage cell of each group being adapted to store an electrical manifestation of a binary 1, or an electrical manifestation of a binary 0, a preamplifying sense latch for each of said groups of storage cells for controllably sensing the binary value 0 or 1 stored in any one of said storage cells included within the group of storage cells with which said preamplifying sense latch is associated, each of said preamplifying sense latches comprising:

a first input/output terminal, a second input/output terminal,

a first field effect transistor directly connected to each cell of the group of said storage cells associated with said sense latch,

said first field effect transistor being directly connected between said first input/output terminal and said second input/output terminal,

second, third, fourth and fifth field effect transistors respectively connected to said first field effect transistor and to each of the other ones of said second, third, fourth and fifth effect transistors,

control means for controlling the conductivity of said first, second, third, fourth and fifth field effect transistors on a selective basis, further means cooperating with said control means for selectively conditioning a predetermined memory cell in the group associated with said sense latch,

whereby a binary 1 or a binary 0 may be written into, or read/restored from said predetermined memory cell of each said group of said monolithic memory.

3,983,546

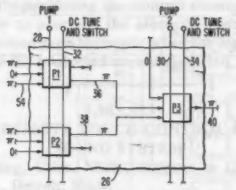
PHASE-TO-PULSE CONVERSION CIRCUITS INCORPORATING JOSEPHSON DEVICES AND SUPERCONDUCTING INTERCONNECTION CIRCUITRY

Hans H. Zappe, Granite Springs, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 341,002, March 14, 1973, Pat. No. 3,863,078, which is a continuation of Ser. No. 267,840, June 30, 1972, abandoned. This application Jan. 23, 1975, Ser. No. 543,568
Int. Cl.[2] G11C *11/44*
U.S. Cl. 340—173.1 8 Claims

1. An apparatus for converting information represented by the phase of a signal to information represented by electrical pulses, comprising:

a Josephson tunneling device having coupled thereto a first input signal of a first phase, said tunneling device having a superconducting state and a resistive state and being capable of being switched therebetween by said input signal,



a conductor line connected to said Josephson tunneling device for conducting an electrical pulse when said Josephson tunneling device switches to its resistive state,

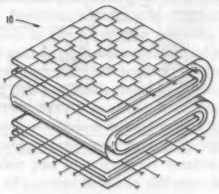
means for providing electrical current through said Josephson tunneling device.

3,983,547

THREE-DIMENSIONAL BUBBLE DEVICE

George S. Almasi, Katonah, N.Y., assignor to International Business Machines - IBM, Yorktown Heights, N.Y.

Filed June 27, 1974, Ser. No. 483,500
Int. Cl.[2] G11C *11/14*
U.S. Cl. 340—174 TF 7 Claims



1. A three-dimensional magnetic apparatus characterized by a plurality of magnetic bubble supporting regions located on a continuous substrate wherein said substrate is folded on itself to form said three-dimensional apparatus and means for providing a magnetic field for supporting and propagating magnetic bubbles in said regions which is common to all said regions.

3,983,548

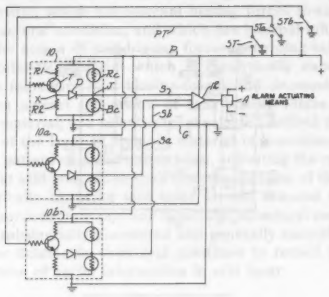
FIRE DETECTION SYSTEM

Howard L. Tufts, 9 Fisher Road, Hingham, Mass. 02043

Filed Feb. 19, 1975, Ser. No. 550,932
Int. Cl.[2] G08B *17/06*
U.S. Cl. 340—228 R 8 Claims

1. A detector system, comprising alarm actuating means and a detector element remote therefrom and connected thereto by a power lead, a signal lead and a ground path, and means for testing the continuity of the power lead and the signal lead, said means comprising first switching means at the detector which, when activated, completes a circuit between the power lead and the signal lead to apply a voltage from the

power lead to the signal lead great enough to activate the alarm actuating means and second switching means remote



from the first switching means for activating said first switching means at the detector.

3,983,549

DIGITALLY-OPERATED DISPLACEMENT DETECTING SYSTEM

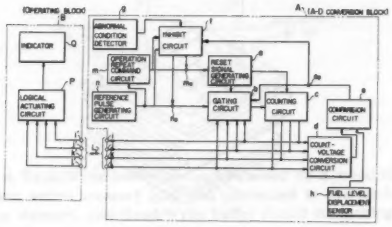
Sigeyuki Akita, Okazaki, and Akira Kuno, Nagoya, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Feb. 26, 1974, Ser. No. 445,901

Claims priority, application Japan, Feb. 27, 1973, 48-23917; May 17, 1973, 48-54934

Int. Cl.² G08C *19/16*

U.S. Cl. 340—206 14 Claims



13. A digital displacement detecting system for detecting the amount of displacement of the level of fluid in a tank in the form of a digital value comprising:

reference pulse generating means for generating reference pulses having a predetermined frequency;

counting means having an input terminal connected to said reference pulse generating means and a plurality of output terminals and resettable at predetermined intervals of time to count said reference pulses in the form of a digital value;

count-voltage conversion means having a plurality of input terminals connected to the plurality of output terminals of said counting means and an output terminal whereby the count of said counting means is converted into a count voltage having an analog value corresponding to said count;

a displacement sensor for generating a detected voltage having an analog value corresponding to said fluid level;

comparison means having a first input terminal connected to said displacement sensor, a second input terminal connected to the output terminal of said count-voltage conversion means and an output terminal whereby an output is generated when said count voltage generated by said count-voltage conversion means attains the value of said detected voltage generated by said displacement sensor;

a count holding means responsive to an output signal generated at the output terminal of said comparison means, thereby to hold the counted value of said counting means;

means for detecting an abnormal condition which would erroneously vary the analog value of said displacement sensor and producing an abnormal condition signal in response thereto; and

inhibit logic means connected between said count holding means and said comparison means for preventing passage of said output signal generated by the output terminal of said comparison means to said count holding means when said abnormal condition signal is produced.

3,983,550

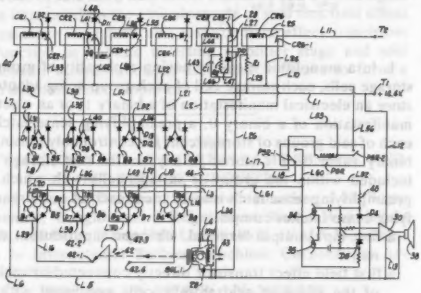
AURAL-VISUAL PRODUCT DISPLAY

Stanley B. Goss, Pepper Pike; Martin J. Nagel, Northfield Center, and Ole K. Nilssen, Chagrin Falls, all of Ohio, assignors to Tenna Corporation, Warrensville Heights, Ohio

Filed Jan. 25, 1974, Ser. No. 436,523

Int. Cl.² G09F *9/00*

U.S. Cl. 340—221 22 Claims



1. An audio-visual display system especially useful for displaying and promoting the sale of products, comprising:

a support for displaying a plurality of products,

a plurality of individual means to separately produce visually perceivable outputs,

a single information storage medium with a surface carrying a plurality of separate audio messages at different locations,

means including a plurality of actuatable selectors each associated with different support locations for displayed products, a different stored message, and a different visually perceivable output, and circuit means associated with each selector and operative to select any one of a plurality of messages recorded at different locations on said surface and an accompanying visible effect responsive to actuation of any one of said selectors,

means responsive to actuation of any one of said selectors to emit a selected message and to produce an accompanying visible effect, and

means operable in response to actuation of any one of said actuatable selectors to prevent an actuation of a second selector from selecting a message while a message is being emitted.

3,983,551

ALARM SYSTEM FOR COIN-OPERATED TELEPHONE

William R. Raymond, La Canada, Calif., assignor to Theodore S. Hoffman, San Marino, Calif.

Filed July 15, 1974, Ser. No. 488,325

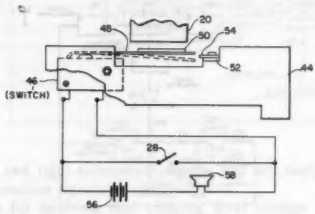
Int. Cl.² G08B *13/00*

U.S. Cl. 340—276 3 Claims

1. An alarm system for use with a device having a housing and a removable portion releasably secured to the housing by means of a lock assembly affixed to the removable portion,

said lock assembly having a latch bolt movable between a first position engaging a recess in said housing and a second position for releasing the removable portion, said system comprising:

switch means secured to said housing in proximity to said recess, said switch means having a switch arm positioned in the path of travel of said latch bolt, said switch arm being normally biased toward said latch bolt along said path and being operable against its bias by engaging said latch bolt when said latch bolt is being moved to said first position;



a power source;

alarm means;

electrical circuit means interconnecting said power source, said alarm means and said switch means, said switch means electrically connecting said power source to activate said alarm means only when said latch bolt is out of engagement with said switch arm; and

manually operable retaining means for retaining said switch arm in a position against its bias when said actuating arm is out of engagement with said switch arm to inactivate said alarm system.

3,983,552

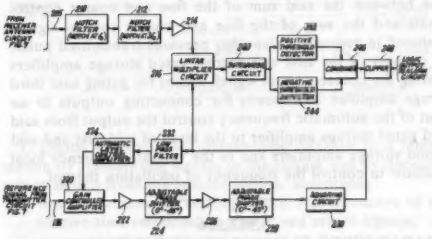
PILFERAGE DETECTION SYSTEMS

Paul E. Bakeman, Jr., Elnora, and Albert L. Armstrong, Latham, both of N.Y., assignors to American District Telegraph Company, Jersey City, N.J.

Filed Jan. 14, 1975, Ser. No. 540,950

Int. Cl.² G08B *13/22*

U.S. Cl. 340—280 **37 Claims**



1. A system for detecting removal of articles from a protected area comprising:

a magnetic marker associated with each article, each marker including a remanently magnetized control element of relatively high coercivity and a switching element of relatively low coercivity, at least a portion of which is magnetized by said remanently magnetized control element in the absence of other magnetic fields of sufficient strength to counteract the effect of said remanently magnetized control element;

means for generating a periodic magnetic field in a region through which an article must pass to leave the protected area for periodically altering the magnetization of the switching element of a marker in said region, said periodic magnetic field having a first frequency and being free of a detectable amount of a predetermined even harmonic of said first frequency;

means for detecting said predetermined even harmonic of said first frequency in the magnetic field produced by the switching element of a marker in response to said periodic magnetic field; and

means for demagnetizing the control element of a marker sufficiently to preclude the aforesaid production of said predetermined even harmonic when the associated article is to leave the protected area undetected.

3,983,553

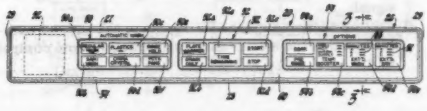
APPLIANCE REMOTE TOUCH-CONTROL PANEL WITH SOUND SYSTEM

Keith K. Kesling, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 12, 1975, Ser. No. 576,802

Int. Cl.² G08C *1/00*

U.S. Cl. 340—365 R **4 Claims**



1. A touch control apparatus for a domestic appliance comprising, an elongated box-shaped casing having a rectangular opening in one side wall, a composite touch responsive control panel assembly closing said wall opening, the user's side of said panel assembly presenting a continuous uninterrupted surface formed by a flexible sheet of impervious plastic material having deflectable areas, said user's side having a plurality of appliance control flexible pads delineated thereon at said deflectable areas with each pad including indicia defining an appliance function, electrically conducting means on said panel assembly in the form of a plurality of single fixed contacts, each of said fixed contacts arranged to interconnect with a movable contact member secured on the inner face of each said flexible pad at a deflectable area providing a series of flexible pad switches, a musical tone generator circuit including a speaker positioned in said casing, each said flexible pad switch being responsive to a preselected deflecting force to the flexible pad to selectively establish an electrical path for the flow of current between different portions of said circuit, and each said flexible pad switch being operative when closed to select a predetermined resistive value in said tone generator circuit causing an electrical pulse to generate a frequency for driving said speaker producing a predetermined audible tone, whereby a distinguishable audible musical tone is obtained for each flexible pad switch to assure the user of the actuation of the preselected appliance function.

3,983,554

ELECTRIC POWER DISTRIBUTION SYSTEM INCLUDING A MASTER ANNUNICATOR AND CENTRAL CONTROL UNIT

John Park Goode, Fort Mitchell, Ky., assignor to ESB Incorporated, Philadelphia, Pa.

Filed Mar. 25, 1975, Ser. No. 561,794

Int. Cl.² G08B *26/00*

U.S. Cl. 340—413 **2 Claims**

1. In a power distribution system comprising a plurality of isolated power supplies and a plurality of line isolation monitors wherein each line isolation monitor is operatively connected to an individual isolated power supply and wherein each line isolation monitor comprises:

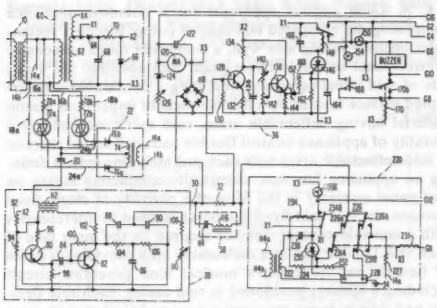
a. a power supply;

b. measuring means for measuring the leakage current to ground of the individual isolated power supply to which it is connected;

c. first alarm means for emitting a first audible alarm signal and an electrical alarm signal when the leakage current to ground is greater than a chosen limit;
d. first silencing means for silencing the first audible signal; and
e. test means for inserting an artificial current leakage to ground in the isolated power supply to which it is connected.

the improvement comprising: a single master annunciator and remote control unit for monitoring and controlling each line isolation monitor, said single master annunciator and remote control unit being operatively connected to each line isolation monitor via a plurality of connecting circuits with each connecting circuit connecting an individual line isolation monitor to the master annunciator and remote control unit, the single master annunciator and remote control unit comprising:

1. second alarm means for emitting a second audible alarm when any line isolation monitor emits an electrical alarm signal;
2. indicating means for indicating which of the plurality of line isolation monitors is emitting an electrical alarm signal;
3. second silencing means for silencing the second audible alarm in the master annunciator and remote control unit;

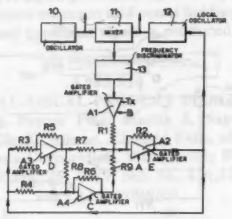


4. energizing means for energizing the first silencing means in any line isolation monitor emitting an audible alarm and for energizing the second silencing means to thereby simultaneously silence both the first and second audible alarms;
5. single means for sequentially determining the magnitude of any leakage current in each isolated power supply;
6. activating means for sequentially activating the test means of each of the plurality of line isolation monitors to thereby sequentially insert an artificial current leakage to ground in each of the isolated power supplies;
7. line isolation monitor failure means for emitting a failure alarm signal upon the occurance of at least one of the following events, failure of the power supply of any of the line isolation monitors, loss of ground connection in any of the line isolation monitors and opening of the alarm signal loop of any of the line isolation monitors;
8. identifying means for identifying the line isolation monitor emitting a failure alarm signal, and;
9. aborting means for aborting any sequential function and returning the master annunciator and remote control unit to an initial alert position.

3,983,555
RADAR RECEIVERS

John Malcolm Morrison, and Charles McGregor Stewart, both of Edinburgh, Scotland, assignors to Ferranti, Limited, Hollinwood, England

Filed July 12, 1974, Ser. No. 488,179
Claims priority, application United Kingdom, July 14, 1973, 33647/73
Int. Cl.² G01S 9/02; H04B 1/40
U.S. Cl. 343—5 R 4 Claims



1. In a radar receiver for a frequency agile radar which includes a variable - frequency local oscillator and an automatic frequency control circuit responsive to a transmitted pulse to produce a fine control signal to exert fine control over the frequency generated by the local oscillator, the improvement of control means operable to produce a coarse control signal to exert coarse control over the frequency generated by the local oscillator, said control means comprising a first, a second and a third gated storage amplifier, means for connecting the output of the automatic frequency control circuit to the input of the third storage amplifier, means for applying a gate signal to said first storage amplifier such that said first amplifier is gated at such a time as to store the sum of the fine and coarse control signals produced in response to a previous transmitted pulse, means for connecting the output of the first gated storage amplifier to the input of said second gated amplifier, and to the input of said third gated amplifier, means for connecting the output of the second gated storage amplifier to the input of the third gated storage amplifier, means for applying a gate signal to said second storage amplifier such that said second amplifier is gated at such a time as to store the difference between the said sum of the fine and coarse control signals and the sum of the fine and coarse control signals produced in response to another previous transmitted pulse, the outputs of the first and second gated storage amplifiers forming the coarse control signal, means for gating said third storage amplifier and means for connecting outputs to an input of the automatic frequency control the output from said third gated storage amplifier to the input of said first and said second storage amplifiers and to the variable-frequency local oscillator to control the frequency of oscillation thereof.

3,983,556
RADAR VIDEO CLIPPING LEVEL DERIVED FROM TARGET SIGNAL

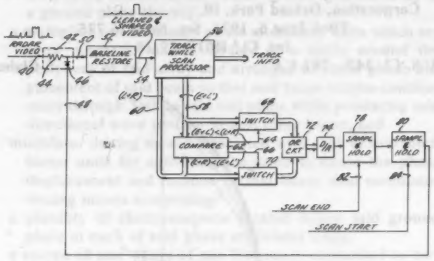
Paul M. Danzer, Norwalk, and Giles E. Rae, Ridgefield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 27, 1972, Ser. No. 248,240
Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976
Int. Cl.² G01S 7/28
U.S. Cl. 343—7 A 5 Claims

1. In a scanning pulse radar system having processing means providing signals representing the summation of early and late target return signal voltages and the summation of right and left target return signal voltages in response to target return signal voltage levels in a multi-phase target window, and having a radar video clipper responsive to a reference voltage for

cleaning and shaping radar video prior to application to the processing means, the improvement comprising:

means for developing a clipping level voltage proportional to at least one of the signals included in the group of the



left and right summation signals and the early and late summation signals in one scan; and

means for applying said clipping level voltage in a next succeeding scan as the reference voltage to the radar video clipper.

3,983,557

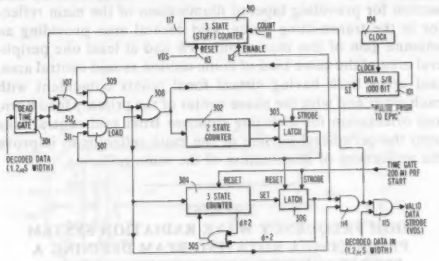
DIGITAL DME WITH COMPENSATION FOR GROUND STATION INTERMITTENCIES

Ronald Lee Powell, King of Prussia, and Frank Patterson Smith, II, Dresher, both of Pa., assignors to Narco Scientific Industries, Inc., Fort Washington, Pa.

Filed Apr. 28, 1975, Ser. No. 571,844

Int. Cl.² G01S 9/56

U.S. Cl. 343—7.3 **10 Claims**



1. Digital apparatus for determining distance to a remote station by transmitting signals to the station and by decoding return signals from the remote station, comprising:

a. memory means for storing signals representative of the relative time relationship of received return signals;

b. pass-recirculate logic means

i. for coupling all return signals received during a first epic to said memory means,

ii. for comparing return signals received during subsequent epics with stored signals from a previous epic in said memory having associated time relationships, and

iii. for restoring signals in said memory upon coincidence of a received return signal with an associated stored signal; and

c. logic means for restoring a given stored signal in said memory means for a predetermined number of epics, irrespective of receipt of return signals from said ground station; and

d. means for identifying when only one signal is stored in said memory means, and deriving said distance therefrom.

3,983,558

MOVING TARGET INDICATING (MTI) RADAR SYSTEMS EMPLOYING VEHICLE DISCRIMINATOR APPARATUS

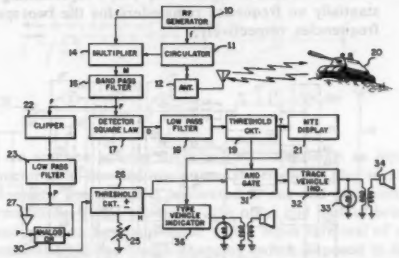
Otto E. Rittenbach, Neptune, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 28, 1974, Ser. No. 484,029

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 10, 1976

Int. Cl.² G01S 9/42; G08B 13/22

U.S. Cl. 343—7.7 **13 Claims**



3. In a moving target indicator radar system of the type including a receiver capable of responding to a return or echo signal reflected from a target within the range of a radar transmitter, which generates a signal free of harmonics, wherein said returned signal includes a Doppler frequency component containing information relative to the nature or type of target, in combination therewith apparatus for identifying the type of target, comprising:

a. first means included in said receiver and responsive to the reception of said returned signal for detecting the magnitude of an even harmonic component of said Doppler component at an output thereof, and

b. means coupled to the output of said first means for providing a control signal when said magnitude of said even harmonic component exceeds a predetermined level indicative of the presence of a moving target of a given nature.

3,983,559

NOVEL STRUCTURE FOR RADIO POSITION FIXING USING HYPERBOLIC PHASE MEASUREMENT

Etienne A. H. Honofe, Chatenay-Malabary, and Emile L. G. Torcheux, Paris, both of France, assignors to Societe d'Etude et d'Application des Techniques Nouvelles NEO-TEC, Paris, France

Filed Dec. 18, 1972, Ser. No. 316,428

Claims priority, application France, Dec. 17, 1971, 71.45492; July 27, 1972, 72.27058; July 27, 1972, 72.27059

Int. Cl.² G01S 1/30

U.S. Cl. 343—105 R **30 Claims**

1. A radio-position-fixing receiver of the hyperbolic-position-line phase-measurement type, for use with at least two transmitting stations (E_1 ; E_2) transmitting continuous waves (0_1 ; 0_2) having respective "specific" frequencies (Fs_1 ; Fs_2) of known nominal values which are specific of the transmitting stations, and interrupted waves (0_{11} ; 0_{21}) having a "measuring" frequency (F_1) of the same known nominal value for both transmitting stations,

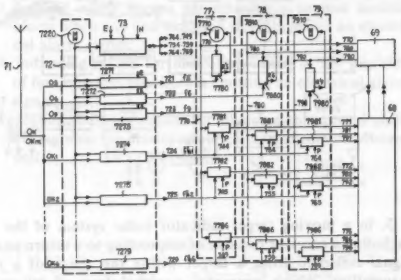
the interrupted waves being non-simultaneously transmitted by the two stations, in accordance with a known fashion related to the locations of the stations and the specific frequencies thereof, characterized in that said receiver comprises:

a first synchronous receiving circuit, having inputs for receiving waves at the said two "specific" frequencies (Fs_1 ; Fs_2), other inputs for local signals to heterodyne and

synchronously demodulate waves at said two specific frequencies (Fs_1 ; Fs_2), and outputs supplying two first remainder signals (R_1' ; R_2') representing the frequency remainders after heterodyning and synchronously demodulating waves received at the two specific frequencies with local signals, respectively;

a first frequency generator for permanently delivering first local signals to the other inputs of said first synchronous receiving circuit, at least two of the first local signals being individually controllable in frequency;

a first control circuit for controlling frequency adjustments of the said two controllable first local signals so as to have said first remainder signals (R_1' ; R_2') representing substantially no frequency remainders for the two specific frequencies, respectively;



a second synchronous receiving circuit, having an input for receiving waves of the said measuring frequency (F_1), other inputs for local signals to heterodyne and synchronously demodulate waves at the measuring frequency (F_1), and an output supplying a second remainder signal representing the frequency and phase remainder after heterodyning and synchronously demodulating received waves at the measuring frequency (F_1) with the local signals;

a second frequency generator, capable of selectively delivering second local signals to the other inputs of the second synchronous receiving circuit, the second frequency generator being coupled to the first frequency generator so that at least two of the second local signals are subjected to frequency corrections which are coupled in predetermined proportionality ratios with the frequency adjustments of said two controllable first local signals, respectively, the predetermined proportionality ratios being substantially equal to the ratios of the known measuring frequency (F_1) to each of the two known specific frequencies (Fs_1 ; Fs_2) respectively associated to the two controllable first local signals, and also at least two of the second local signals being individually controllable in phase;

a second control circuit capable of selectively controlling phase adjustments of said phase controllable second local signals so as to have said second remainder signal representing substantially no frequency remainder and a substantially constant phase remainder; and

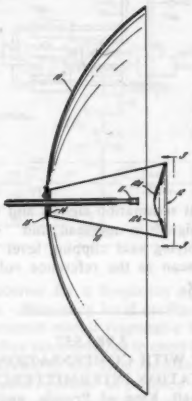
a time-programme circuit, operative during each known time-period of transmission of an interrupted wave by a station having anyone of the two specific frequencies, for selectively coupling the second frequency generator to the second synchronous receiving circuit with the corrected second local signal having a predetermined correction proportionality ratio which is related to the specific frequency of that station, and with an associated one of the two phase controllable second local signals, and for selectively coupling the second control circuit to the second frequency generator to control phase adjustments of that associated phase-controllable second local signal.

3,983,560

CASSEGRAIN ANTENNA WITH IMPROVED SUBREFLECTOR FOR TERRESTRIAL COMMUNICATION SYSTEMS

James Bruce MacDougall, New Lenox, Ill., assignor to Andrew Corporation, Orland Park, Ill.

Filed June 6, 1974, Ser. No. 476,775
Int. Cl.² H01Q *19/18*
U.S. Cl. 343—781 CA **6 Claims**



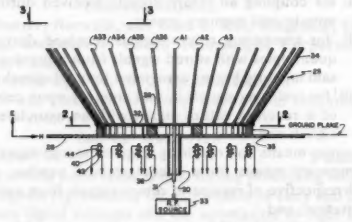
1. A Cassegrain antenna for use in terrestrial communication systems, said antenna comprising the combination of a parabolic main reflector, a primary feed horn, and a subreflector illuminated by the primary feed horn including a central area forming the surface of revolution of a hyperbolic conic section for providing tapered illumination of the main reflector in the transmitting mode, said central area providing an antenna gain of less than about 40% and at least one peripheral area of the same kind of conic section as said central area, said areas both having virtual focal points coincident with each other and with the phase center of the primary feed horn, and orientation for directing spillover from said central area onto the peripheral portion of the main reflector to improve the uniformity of illumination of the main reflector.

3,983,561

HIGH FREQUENCY WAVE RADIATION SYSTEM PRODUCING A ROTATING BEAM DEFINING A PREDETERMINED GEOMETRICAL PATTERN

Alvaro D. Biagi, Huntington Station; Richard Silbiger, Dix Hills, and Leslie Orloff, Huntington, all of N.Y., assignors to Republic Electronic Industries, Inc., Melville, N.Y.

Filed Sept. 2, 1975, Ser. No. 609,235
Int. Cl.² G01S *1/48*
U.S. Cl. 343—787 **4 Claims**



1. An electromagnetic wave radiation system comprising:

a stationary discone antenna array for transmitting a beam rotating in one plane and defining a directional wave pattern in another plane orthogonal to said one plane;

a source of high frequency wave energy comprising an input conductor located at the center of said antenna array at a ground plane thereof;

a multiplicity of stationary phase modulator units which are ferro magnetic masses located in a circle around the periphery of said array and arranged to cause phase displacement of said beam so that said beam rotates continuously through 360° in said one plane while producing said directional wave pattern in said other plane; and

modulator driving means associated with each of said modulator units for activating the same to cause the phase displacement and rotation of said beam; said modulator driving means comprising:

a plurality of electromagnets located below said ground plane at each of said phase modulator units;

a source of sine waves of one frequency connected to certain spaced ones of said electromagnets;

a means for shifting said sine waves in phase by 90°; and

a circuit means connecting said wave shifting means to other spaced ones of said electromagnets whereby a multiple lobed pattern is generated when said beam rotates through 360°.

3,983,562

MONO-LOBED SCANNER

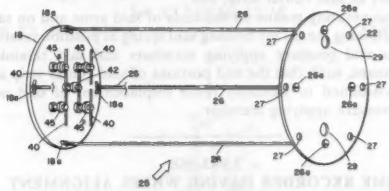
William C. Blanchard, and James E. Kreiner, Jr., both of Baltimore, Md., assignors to The Bendix Corporation, Southfield, Mich.

Filed Mar. 28, 1975, Ser. No. 563,244

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² H01Q *19/16*

U.S. Cl. 343—815 **9 Claims**



1. Apparatus for correcting the positional inaccuracy of an antenna having a parabolic dish and an antenna element array spaced apart from said parabolic dish and directed into said dish, said antenna element array having at least four antenna elements polarized alike and displaced with orthagonal symmetry about the boresight axis of said antenna comprising:

a ground plane for said antenna elements;

means for fixedly holding said ground plane spaced apart from said parabolic dish and parallel thereto with said four antenna elements displaced with orthagonal symmetry about the boresight axis of said antenna; and,

four elongated electrically conductive elements each having a relatively small cross sectional area arranged about said antenna elements equally spaced radially from said boresight axis and generally parallel thereto and generally equally angularly spaced about one wavelength apart, the spacing being adjustable.

3,983,563

ANTENNA ADAPTER FOR TELEVISION

Koji Nakayama, 305, No. 1-1-1, Hara, Meguro, Tokyo, Japan

Filed Oct. 15, 1974, Ser. No. 514,888

Claims priority, application Japan, Oct. 16, 1973, 48-120125

Int. Cl.² H01Q *1/46*

U.S. Cl. 343—861 **5 Claims**

1. An antenna adapter for television comprising: an input connector to be inserted into a standard electrical plug socket for domestic use, which is connected to one end of a feeder intermediately with a condenser, the other end thereof being formed so as to be connectable to the input terminal of an antenna, at least one circuit-changing switch disposed in the midpoint of said feeder for appropriately changing the impedance of said feeder and interconnection means connected to said switch for providing different impedance paths depending on the position of said switch.

3,983,564

IMAGE RECORDING MEMBER

Mitsunobu Nakazawa, Tokyo; Yoshiaki Araki, Yokohama; Masahiro Haruta, Funabashi, and Kunio Satomi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 509,684, Sept. 26, 1974, abandoned. This application Aug. 18, 1975, Ser. No. 605,469

Claims priority, application Japan, Sept. 28, 1973, 48-109963

Int. Cl.² G01D *15/34*

U.S. Cl. 346—1 **36 Claims**

1. A method for forming an image on an image recording member comprising the step of applying energy to a recording layer comprising at least one kind of graphite fluoride and at least one kind of fluorine acceptor, both being the effective components of said image recording layer.

3,983,565

DEVICE FOR RECORDING SPEED OPERATING CONDITIONS OF A WHEELED VEHICLE

Ernst Koller, Paradiesstrasse 64, Binningen, Switzerland (CH-4102)

Filed Dec. 23, 1975, Ser. No. 643,819

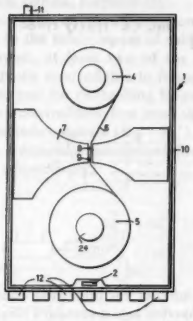
Claims priority, application Switzerland, Dec. 27, 1974, 17274/74

Int. Cl.² G01D *9/00, 9/30*

U.S. Cl. 346—18 **7 Claims**

1. A device for recording speed operating conditions of a vehicle, having means such as a wheel on which it travels over the ground, comprising a housing, at least one first speed information recording stylus, a connection on said housing for connecting said first speed information recording stylus to the wheel for indicating the speed of travel of the vehicle, a continuous recording medium movable past the stylus for receiving the recording of the speed of travel of the vehicle, at least one second excess speed information recording stylus located adjacent the recording medium, speed settable means connectable to said second stylus and said connection to actuate

said second stylus to record excess speed information on said medium when the speed which has been set on said settable



means is exceeded, and drive means connected to said medium to move said medium at a predetermined speed.

3,983,566

APPARATUS FOR RECORDING OF AN ANNULAR RECORD CARRIER

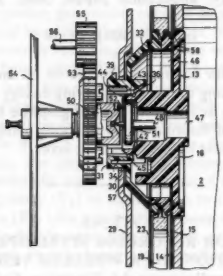
Karl Vögtlin; Hans Zimmermann, and Hartmut Schultze, all of Villingen-Schwenningen, Germany, assignors to Kienzler Apparate GmbH, Villingen, Germany

Filed July 9, 1975, Ser. No. 594,261

Claims priority, application Germany, July 13, 1974, 2433745

Int. Cl.² G01D *9/04*

U.S. Cl. 346—44 **13 Claims**



1. In an apparatus wherein an annular record carrier is rotated in correspondence with the passage of time and an ongoing recording is made thereon, a combination comprising a housing having two sections which are relatively pivotable between an open position in which record carriers can be inserted into and removed from said housing, and a close position in which a recording is made on a record carrier located within the closed housing; first means in one of said housing sections for rotating the record carrier and including a rotary support for the record carrier and a spindle extending through a center opening of the latter; and self-centering second means turnably mounted in the other of said housing sections with freedom of play for centering itself relative to said spindle in response to movement of said housing sections towards said closed position, and for snapping in its centered position against a record carrier on said support when said housing sections move to said closed position, so that said second means rotates with said support and record carrier.

3,983,567

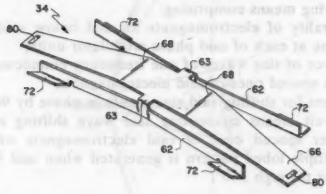
PRESSURE ROLLER ASSEMBLY FOR SELF PROCESSING CAMERA

Guilford E. Kindig, and James E. Dierks, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 20, 1975, Ser. No. 551,445

Int. Cl.² G03B *17/50*

U.S. Cl. 354—86 **6 Claims**



1. A pressure applying assembly for use in self-processing cameras to process self-developing film units, comprising:

a. a pair of elongate pressure applying members between which the self-developing film unit is passed to initiate developing;

b. means for retaining said pressure applying members in substantially parallel alignment while allowing some relative displacement away from each other;

c. a spring for yieldably resisting such displacement of one of said pressure applying members relative to the other, said spring having three substantially parallel strips connected near their centers by relatively narrow bridges of spring material, said narrow bridges being bent so that the two outside strips form arms that are flexible in a direction generally perpendicular to the flex of the center strip and substantially inflexible in a direction parallel to the flex of said center strip, and

d. cooperating means on the ends of said arms and on said retaining means for holding said spring in position relative to said pressure applying members and said retaining means, such that the end portions of said center strip are positioned to yieldably resist displacement of said one pressure applying member.

3,983,568

TIME RECORDER HAVING WHEEL ALIGNMENT MEANS

Rudolph B. Danke, Petersham, Mass., assignor to Simplex Time Recorder Company, Gardner, Mass.

Division of Ser. No. 436,148, Jan. 24, 1974, Pat. No. 3,890,624, which is a division of Ser. No. 236,358, March 20, 1972, Pat. No. 3,800,301. This application Apr. 10, 1975, Ser. No. 566,802

Int. Cl.² G07C *1/06*

U.S. Cl. 346—91 **3 Claims**

1. A time recorder, comprising:

a. a housing,

b. a time stamp shaft mounted in the housing,

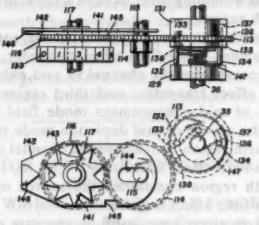
c. a plurality of time wheels mounted on the shaft,

d. an electric motor mounted on the frame and serving to drive a driver shaft,

e. a pawl mechanism operated by the motor and operative to index the wheels,

f. an additional wheel having a plurality of characters formed on its periphery mounted on the shaft and continuously driven by the motor, and

g. means to bring the closest character on the additional wheel to a printing position in alignment with characters on the other wheels, the means consisting of two spaced collars fastened to the driver shaft, a gear and a washer rotatably mounted on the shaft between the collars, a first peg fastened to the gear and extending axially through a notch in the washer, a second peg fastened to the washer



and extending through an arcuate slot in the gear into a notch in one of the collars, and a torsion spring coiled around the shaft and having two ends each of which engages a peg to bias the two pegs and their respective gear and washer in different directions of rotation, the means serving to return the additional wheel after printing to the position it would have occupied if printing had not taken place.

3,983,569

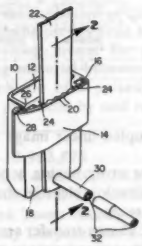
INSTRUMENT PEN WITH INTEGRAL PEN ARM ATTACHMENT MEANS

James R. Hubbard, Moorestown, and Charles A. Erdman, Marlton, both of N.J., assignors to Graphic Controls Corporation, Buffalo, N.Y.

Continuation-in-part of Ser. No. 540,123, Jan. 10, 1975. This application Oct. 6, 1975, Ser. No. 619,632

Int. Cl.² G01D *15/18*

U.S. Cl. 346—140 A **12 Claims**



1. In an instrument marker pen body including an ink reservoir and means for receiving a writing tip, the improvement comprising a pen arm holding means consisting of an integrally molded hinged member adapted to fold against a surface of the pen body and to be locked against said surface by engageable locking means and to receive and secure in place against said surface a pen arm when said hinged member is in its folded and locked position.

3,983,570

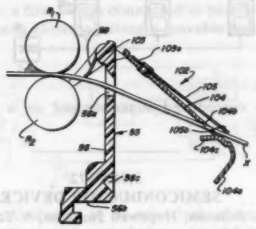
CAMERA CONSTRUCTION

John Maltese, Saddle Brook, N.J.; Israel Nesson, Brighton, Mass., and Robert Mitchell, Pequannock, N.J., assignors to Berkey Photo, Inc., Clifton, N.J.

Filed Mar. 17, 1975, Ser. No. 558,933

Int. Cl.² G03B *17/50*

U.S. Cl. 354—86 **7 Claims**



1. A camera construction comprising a housing with a compartment therein provided with an entry for removably accommodating a cartridge containing a plurality of selfdeveloping photographic sheets arranged in superposed relation and with a corresponding surface of each sheet being light sensitive and having mounted thereon a rupturable packet containing a predetermined amount of developing liquid, drive means within the housing for selectively removing a sheet from the cartridge subsequent to the light sensitive surface thereof being exposed, spreader means rupturing the packet and spreading the developing liquid thereof across the exposed surface of the sheet removed from the cartridge, and a door assembly mounted on the housing for movement between open and closed positions with respect to the compartment entry; said door assembly including a first member for overlying in a fixed position the compartment entry, when said assembly is in a closed position, said first member being provided with an elongated narrow opening through which the exposed photographic sheet passes while said first member is in said fixed position and subsequent to being removed from the accommodated cartridge and being engaged by said spreader means, and a second member carried on said first member and normally assuming a closed relation with respect to said narrow opening, said second member being movable independently of said first member by the leading edge of the moving photographic sheet to an angular open relation with respect to said narrow opening while said first member remains in said fixed position whereby said first and second members cooperate with one another to impart a convex deflection to the exposed light sensitive surface of the moving photographic sheet as it passes through said narrow opening.

3,983,571

ELECTRONIC IMAGE IDENTIFYING SYSTEM

Paul Michael Russo, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed June 30, 1975, Ser. No. 591,952

Int. Cl.² G03B *17/24*

U.S. Cl. 354—105 **5 Claims**

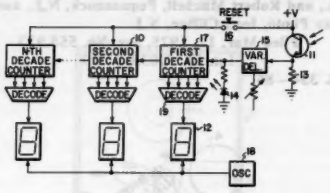
1. A image identifying system for use in a light-activated image reproduction apparatus, comprising in combination:

light sensing means responsive to a change in ambient light generated by said reproduction apparatus for producing an output signal;

counter means responsive to said output signal for incrementing an electrically encoded number; and

display means arranged to be disposed between the image to be reproduced and said reproduction apparatus, and

responsive to said counter means for producing an identifier corresponding to said encoded number in a manner



to be reproduced superimposed on a portion of said image.

3,983,572

SEMICONDUCTOR DEVICES

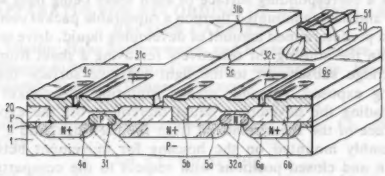
William S. Johnson, Hopewell Junction, N.Y., assignor to International Business Machines, Armonk, N.Y.

Division of Ser. No. 377,851, July 9, 1973, Pat. No. 3,873,372. This application Oct. 18, 1974, Ser. No. 516,060

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976

Int. Cl.² H01L *29/78, 27/02*

U.S. Cl. 357—23 4 Claims



1. A semiconductor device structure including an enhancement mode field effect transistor and a depletion mode field effect transistor, said semiconductor device structure comprising:

a body of silicon semiconductor material of P— conductivity type and having at least one planar surface;

a first discrete region of N+ conductivity type lying beneath and extending to said surface of said planar surface;

a second discrete region of P conductivity type lying beneath and extending to said surface of said planar surface;

a third discrete region of N+ conductivity type lying beneath and extending to said surface of said planar surface;

a fourth discrete region of N conductivity type lying beneath and extending to said surface of said planar surface;

a fifth discrete region of N+ conductivity type lying beneath and extending to said surface of said planar surface;

said second region lying between and extending from said first region to said third region;

said fourth region lying between and extending from said third region to said fifth region;

a sixth discrete region of P conductivity type;

said sixth region lying beneath and extending to the surface of said planar surface;

said first, second, third, fourth and fifth regions being wholly encompassed on said planar surface by said sixth region;

a relatively thick insulating layer overlaying said planar surface;

said layer being of substantially uniform thickness except for a relatively thin first area of said layer precisely overlaying said second region, and a relatively thin second area of said layer precisely overlaying said fourth region;

said layer having first, second and third apertures respectively exposing portions of said planar surface in said first, third and fifth regions;

first, second and third electrodes respectively making electrical contact with via said first, second and third apertures with said first, third and fifth regions;

a fourth electrode overlaying said relatively thin first area of said insulating layer to form a capacitive couple to said second region;

a fifth electrode overlaying said relatively thin second area of said insulating layer to form a capacitive couple to said fourth region;

where said first region constitutes the source of said enhancement mode field effect transistor, said second region constitutes the channel of said enhancement mode field effect transistor, said third region constitutes the drain of said enhancement mode field effect transistor and the source of said depletion mode transistor,

said fourth region constitutes the channel of said depletion mode field effect transistor,

said fifth region constitutes the source of said depletion mode field effect transistor,

said fourth electrode constitutes the gate electrode of said enhancement mode field effect transistor,

said fifth electrode constitutes the gate electrode of said depletion mode field effect transistor, and

said sixth region provides field protection for said structure comprising said enhancement mode field effect transistor and said depletion mode field effect transistor.

3,983,573

CHARGE-COUPLED LINEAR IMAGE SENSING DEVICE

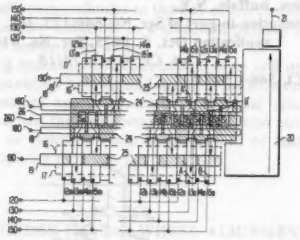
Yasuo Ishihara, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Mar. 12, 1975, Ser. No. 557,845

Claims priority, application Japan, Mar. 12, 1974, 49-28234; Feb. 24, 1975, 50-23189

Int. Cl.² H01L *29/78, 27/14, 31/00;* H03K *3/353*

U.S. Cl. 357—24 4 Claims



1. A charge-coupled linear image sensing device comprising:

an image sensor array having a plurality of image sensor elements to develop electric charges upon incidence of light rays thereon;

first and second charge-transfer arrays disposed on opposite sides of said image sensor array, respectively, each having a plurality of charge-transfer stages corresponding to respectively ordered ones in each sequential set of four successive said image sensor elements;

third and fourth charge-transfer arrays disposed between said image sensor array and said first and second charge-transfer arrays, respectively, each having a plurality of charge-transfer stages corresponding to respectively ordered ones in each sequential set of four successive said image sensor elements; and

first means for transferring the charges developed in the four successive image sensor elements of said each set to

said first, second, third and fourth charge-transfer arrays, respectively;

said first transferring means including first and second electrodes disposed between said first and third charge-transfer arrays and between said second and fourth charge-transfer arrays, respectively, and third and fourth electrodes being disposed between said image sensor array and said third and fourth charge-transfer arrays, respectively;

second means for transferring the developed charges transferred from said image sensor array to said first, second, third and fourth charge-transfer arrays therein; said second transferring means including a plurality of charge-transfer electrodes disposed to extend between said first and third charge-transfer arrays and between said second and fourth charge-transfer arrays, respectively.

3,983,574

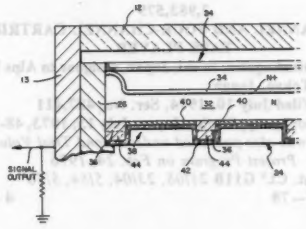
SEMICONDUCTOR DEVICES HAVING SURFACE STATE CONTROL

Hermann Statz, Wayland, and Wolfgang M. Feist, Burlington, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 365,927, June 1, 1973, abandoned. This application Feb. 27, 1975, Ser. No. 553,717

Int. Cl.² H01L 27/14

U.S. Cl. 357—31 **14 Claims**



1. In combination:

a body of semiconductor material having a plurality of junctions formed at spaced locations on said body;

said junctions being formed between said semiconductor body and thin regions of insulating material;

means for producing a reverse bias across said junctions; and

means for preventing the formation of conductive channels through said semiconductor material between said junction regions comprising means for producing charge regions in insulating material between adjacent ones of said junctions which are of a polarity opposite to the polarity of charges produced by said reverse bias.

3,983,575

COLOR SATURATION AND CONTRAST CONTROL CIRCUITRY RESPONSIVE TO AMBIENT LIGHT

Kunio Nagai, Tokyo, and Tooru Akutagawa, Chiba, both of Japan, assignors to Sony Corporation, Tokyo, Japan

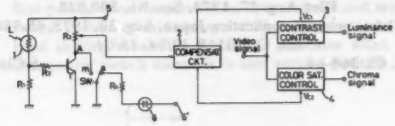
Filed May 12, 1975, Ser. No. 576,892

Claims priority, application Japan, May 20, 1974, 49-57266[U]

Int. Cl.² H04N 9/535, 5/58

U.S. Cl. 358—27 **8 Claims**

1. A picture control circuit for use in a color television receiver comprising power supply means; a first variable resistor having a movable contact; a first resistor connected between said power supply means and said first variable resistor; a variable impedance element connected in series with said variable resistor, said variable impedance element having a control electrode for receiving a control signal to determine the impedance thereof; a photosensitive device coupled to said control electrode of said variable impedance element to supply said impedance determining control signal thereto in response to ambient light; a voltage-controlled contrast control circuit and a voltage-controlled color saturation control circuit operable on the video signal from which said picture is reproduced to thereby adjust the contrast and color saturation of said reproduced picture, said contrast control circuit and said color saturation control circuit being controlled by a control voltage derived from said movable contact of said first variable resistor; a first switch connected in parallel with said variable impedance element having a movable contact and a



stationary contact adapted to be selectively closed so as to establish a manual control mode independent of the ambient light condition and to be selectively opened so as to establish an automatic control mode whereby said picture is controlled as a function of said ambient light condition; and a second switch connected in parallel with said first resistor and ganged with said first switch, said second switch having a movable contact and a stationary contact adapted to be opened in an automatic control mode, thereby enabling said control voltage to change in response to the condition of said ambient light in an automatic control mode even if said movable contact of said first variable resistor is at a predetermined extreme position.

3,983,576

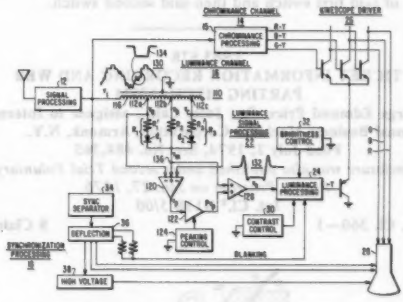
APPARATUS FOR ACCENTUATING AMPLITUDE TRANSISTIONS

Robert Loren Shanley, II, and James McIntire Yongue, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed May 23, 1975, Ser. No. 580,689

Int. Cl.² H04N 9/535

U.S. Cl. 358—38 **11 Claims**



1. Apparatus comprising:

a source of video signals, said video signals including amplitude transitions;

signal delaying means coupled to said source having a plurality of terminals for developing a plurality of video signals delay by different amounts;

means for combining two of said delayed signals which are delayed in time from one another by a predetermined time interval to derive a first combined signal;

means for selectively combining a portion of one of said two delayed signals dependent upon the direction of said amplitude transitions with a portion of at least one other

of said delayed signals, said other signal have a time delay intermediate the time delays of said two delayed signals, to derive a second combined signal; and

means for combining said first and second combined signals to derive an output signal.

3,983,577

INTRODUCTION OF DATA ENTRY COMPLETION SIGNALS TO A CASSETTE TAPE CONTAINING DATA PROCESSING TERMINAL UNIT

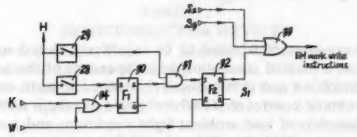
Youichi Ito, Osaka, and Kozo Kitamura, Kyoto, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 27, 1974, Ser. No. 500,928

Claims priority, application Japan, Aug. 30, 1973, 48-98055

Int. Cl.² G11B *19/04*, *15/04*

U.S. Cl. 360—4 6 Claims



1. A data processing terminal unit comprising:

tape means including at least one data field;

recording means associated with said tape means for recording data thereon;

data input means connected with said recording means for transmitting data therethrough to said tape means;

entry means in said data input means providing end marking signals to said recording means to effect end markings on said tape means defining the end of said data field, said entry means including first and second switches for generating said end marking signals in response to operation of both of said switches; and

control circuit means interconnecting said first and second switches for precluding the generation of said end marking signals unless said first and second switches are operated in a predetermined timed relationship, said predetermined timed relationship being the successive operation of said first switch and then said second switch.

3,983,578

TICKET INFORMATION RECORDING AND WEB PARTING MECHANISM

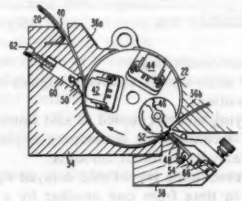
George Edmund Price, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 1, 1974, Ser. No. 484,365

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 27, 1976

Int. Cl.² G11B *5/00*

U.S. Cl. 360—1 8 Claims



1. A ticket information recording and parting mechanism for producing individual tickets from web ticket stock without waste, comprising

a frame structure,

a continuously rotating carrier arranged on said frame structure and carrying,

an information recording member arranged within said carrier, and

one ticket parting anvil member rotatably mounted within said carrier,

a complementary ticket parting blade member arranged on said frame structure,

a web advancing arrangement on said frame structure for passing a web about a part of said carrier and between said carrier and said complementary ticket parting blade member,

camming track means arranged on said frame structure and having a portion of generally circular loop configuration for presenting said anvil member in an attitude permitting said web stock to pass said blade member intact and another portion of generally triangular loop configuration for presenting said anvil member in an attitude substantially normal to the first said attitude for parting said web stock,

camming track following members travelling in said camming track and coupled to said one ticket parting anvil member, and

camming diverter means arranged in said camming track for engaging said camming track follower members for selectively changing the attitude of said one ticket parting anvil member.

3,983,579

TWO-CHANNEL AND FOUR-CHANNEL CARTRIDGE TAPE PLAYER

Motoshi Nishinakagawa, Iwaki, Japan, assignor to Alps Motorola, Inc., Tokyo, Japan

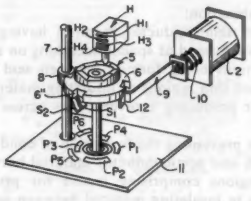
Filed July 10, 1974, Ser. No. 487,411

Claims priority, application Japan, July 13, 1973, 48-79081

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.² G11B *21/08*, *23/04*, *5/54*, *5/56*

U.S. Cl. 360—78 4 Claims



1. A cartridge-type tape player adapted to receive and play two-channel and four-channel tape cartridges, and having amplifier means and output means connected to said amplifier means for receiving signals therefrom for audible reproduction thereof, said player including in combination:

changeover switch means operable between a first position when a two-channel tape cartridge is inserted into the player and a second position when a four-channel tape cartridge is inserted into the player,

magnetic tape head means having four magnetic pick-up areas, said tape head means being movable upon the insertion of two-channel and four-channel tape cartridges to align said pick up areas with selected tracks on the tape,

head shifting means mounted in said player and movable between first, second, third and fourth positions, said head shifting means being engageable with said magnetic tape head means to move the same to align said pickup areas with selected tracks on the tape, said head shifting

means includes a rotatable disc having a top and a bottom surface thereon and having a plurality of notches on the peripheral edge thereof, said top surface having four successive cam regions thereon which correspond to the four-channel tape tracks and said bottom surface having a pair of contacts mounted thereto and selectively engageable with said rotary switch means,

drive means coupled to said head shifting means for rotating said head shifting means between said first, second, third and fourth positions, said drive means further includes a coupling member engageable with and driven by the capstan drive and positioned in a spaced relation for engagement with said rotatable disc to cause the same to be rotated by the coupling member, a solenoid, a lever adapted to engage a notch on the rotatable disc and magnetic linkage means coupled to the said lever, said solenoid operating to move said magnetic linkage means to cause said lever to engage said rotatable disc to move the same whereby said rotatable disc is engaged and rotated by the coupling on the capstan drive shaft to thereby position said pick-up areas on said magnetic tape head means with selected tracks on the tape,

rotary switch means including a first switch portion and a second switch portion, means coupling said second switch portion to said drive means for actuating the same to move said head shifting means, and

said drive means being responsive to operation of said second portion of said switch means to rotate said head shifting means between said first, second, third and fourth positions when said changeover switch means is in said first position and responsive to operation of said second switch portion of said rotary switch means to rotate said head shifting means to successive positions when said changeover switch means is in said second position.

DESIGN PATENTS

GRANTED SEPTEMBER 28, 1976

ERRATA

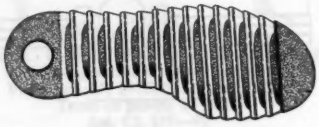
For CLASS	See PATENT NO.
025–056	241,632
025–098	241,634
011–157	241,659
011–146	241,666
011–152	241,667
015–026	241,668
011–081	241,669
015–122	241,675
015–136	241,676
015–145	241,677
016–059	241,680
016–026	241,681
015–004	241,682

DESIGNS

SEPTEMBER 28, 1976

241,585
SPORT BOOT
Joseph P. Famolare, Jr., Florence, Italy, assignor to Famolare, Inc., New York, N.Y.
Filed Apr. 15, 1974, Ser. No. 461,005
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—311

241,586
SOLE
Ladislav Sebestik, Lorraine, Quebec, Canada, assignor to Baron Rubber Ltd., St. Jerome, Quebec, Canada
Filed Jan. 30, 1976, Ser. No. 653,821
Claims priority, application France Nov. 6, 1975
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—320



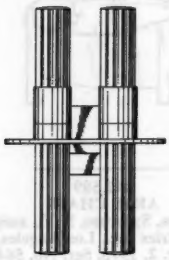
241,587
BASEBALL GLOVE
Kozo Takebayashi, Kaohsiung, Taiwan, assignor to Sakurai International, Inc., Santa Ana, Calif.
Filed May 27, 1975, Ser. No. 573,910
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—361

241,588
SEAT
Stapleton Long, Morristown, Tenn., assignor to The Berkline Corporation, Morristown, Tenn.
Filed Aug. 26, 1975, Ser. No. 607,920
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—37

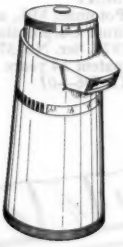
241,589
ARM CHAIR
Harry Laylon, Syracuse, N.Y., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Apr. 2, 1975, Ser. No. 564,249
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—55

241,590
SEAT
Burton H. Kaplan, Potomac, Md., assignor to Rowe Furniture Corporation
Filed May 13, 1975, Ser. No. 577,080
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63

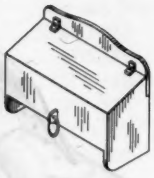
241,591
COMBINED SUPPORT AND CONTAINERS FOR TOOTHBRUSHES
Charles S. Fentules, 15 Illinois Ave., Youngstown, Ohio 44505
Filed May 14, 1975, Ser. No. 577,416
Term of patent 7 years
Int. Cl. D23—*02*
U.S. Cl. D6—94



241,592
DISPENSER FOR HEATING CREAMS, FOAMS, LOTIONS AND THE LIKE
George L. Schick, Trumbull, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.
Continuation-in-part of design application Ser. No. 467,329, May 6, 1974, now Patent No. 234,483. This application Feb. 10, 1975, Ser. No. 548,492.
Term of patent 14 years
The term of this patent subsequent to Mar. 18, 1989, has been disclaimed
Int. Cl. D9—*01*
U.S. Cl. D6—95

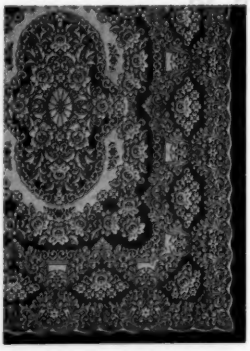


241,593
TOILET PAPER COVER
James W. Wriede, 3466 Pinewood Drive, West Homestead, Pa. 15120
Filed Oct. 26, 1971, Ser. No. 168,797
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—97

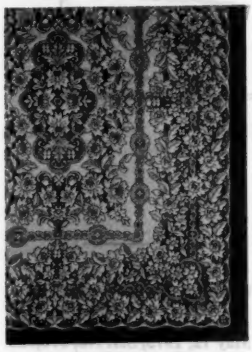


241,594
DECORATIVE PANEL FOR USE ABOVE A BACK BAR
Leon H. Richman, Long Beach, and James Michael Clayton, Costa Mesa, Calif., assignors to Baskin-Robbins Ice Cream Co., Burbank, Calif.
Original design application Mar. 28, 1974, Ser. No. 455,557. Divided and this application May 22, 1975, Ser. No. 580,011
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—193

241,595
TABLECLOTH
Richard A. Fees, Ardsley, Pa., assignor to Quaker Lace Company, Philadelphia, Pa.
Filed Sept. 11, 1975, Ser. No. 612,476
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D6—285



241,596
TABLECLOTH
Richard A. Fees, Ardsley, Pa., assignor to Quaker Lace Company, Philadelphia, Pa.
Filed Sept. 11, 1975, Ser. No. 612,477
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D6—285



241,597
FUNNEL
Raymond C. Confer and Douglas C. Confer, Gasport, N.Y., assignors to Confer Plastics Inc.
Filed Jan. 15, 1975, Ser. No. 541,220
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—68

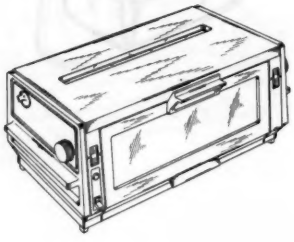
241,598
COMBINED NAPKIN HOLDER AND CONDIMENT CADDY
Hyman Abrams, Paramus, N.J. (P.O. Box 27, North Hackensack Station, River Edge, N.J. 07661)
Filed Dec. 13, 1974, Ser. No. 532,592
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—72

241,599
FREEZER STORAGE CONTAINER
Jack V. Croyle, Woonsocket, R.I., and James B. Swett, Altamonte Springs, Fla., assignors to Dart Industries Inc., Los Angeles, Calif.
Filed Mar. 24, 1975, Ser. No. 560,759
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—76

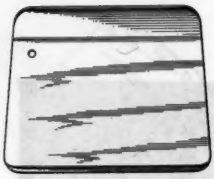
241,600
COMBINED FOOD STORAGE CONTAINERS AND CARRYING HANDLE
Harold P. Ashton, Providence, R.I., assignor to Dart Industries, Inc., Los Angeles, Calif.
Filed Mar. 21, 1975, Ser. No. 560,468
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—76

241,601
COMBINED SKILLET AND CHAFING DISH OR THE LIKE
William Joseph Cook, Trumbull, Conn., assignor to General Electric Company
Filed Sept. 6, 1974, Ser. No. 503,643
Term of patent 3½ years
Int. Cl. D7—*02*
U.S. Cl. D7—90

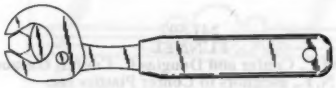
241,602
TOASTER-OVEN
Thomas E. Hanson, Philadelphia, Pa., and Stephen Maher, Portsmouth, Va., assignors to SCM Corporation, New York, N.Y.
Filed Apr. 16, 1975, Ser. No. 568,638
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—93



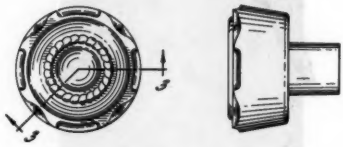
241,603
COMBINED FOOD SCOOP AND CHOPPER
Robert P. MacNeil, 360 1st Ave., New York, N.Y. 10010
Filed Apr. 18, 1975, Ser. No. 569,357
Term of patent 3½ years
Int. Cl. D7—*04*
U.S. Cl. D7—104



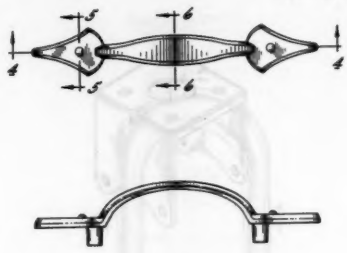
241,604
TUBE FITTING WRENCH
Jerry E. Ward, Star Route, Box 222, Vian, Okla. 74962
Filed May 12, 1975, Ser. No. 576,335
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—22



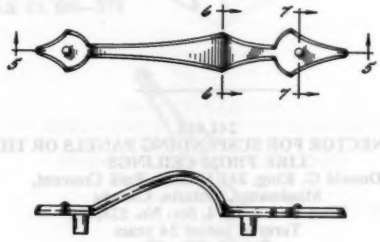
241,605
DOOR KNOB
Raymond U. H. Tegner, Lodi, Wis., assignor to Amerock Corporation, Rockford, Ill.
Filed Dec. 12, 1975, Ser. No. 640,031
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—143



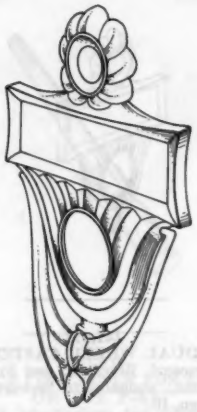
241,606
PULL
Raymond U. H. Tegner, Lodi, Wis., assignor to Amerock Corporation, Rockford, Ill.
Filed Sept. 17, 1975, Ser. No. 614,317
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—166



241,607
PULL
Raymond U. H. Tegner, Lodi, Wis., assignor to Amerock Corporation, Rockford, Ill.
Filed Sept. 18, 1975, Ser. No. 614,485
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—169



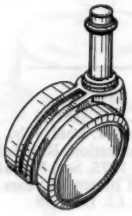
241,608
DOOR KNOCKER
Edward J. Kunkel, Concord, Calif., assignor to Henry A. Smith
Filed Dec. 19, 1975, Ser. No. 642,393
Term of patent 14 years
Int. Cl. D8—*09*; D10—*06*
U.S. Cl. D8—177



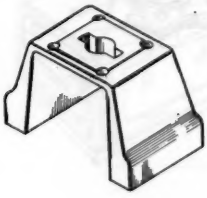
241,609
ESCUTCHEON
Raymond U. H. Tegner, Lodi, Wis., assignor to Amerock Corporation, Rockford, Ill.
Filed Dec. 12, 1975, Ser. No. 640,078
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—179

241,610
DOOR PLATE
Edward J. Kunkel, Concord, Calif., assignor to Henry A. Smith
Filed Dec. 19, 1975, Ser. No. 642,401
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—180

241,611
DUAL WHEEL CASTER
Donald C. Crescenzi, Branford, and Frank J. Fontana, Stratford, Conn., assignors to Stewart-Warner Corporation, Chicago, Ill.
Filed Nov. 17, 1975, Ser. No. 632,724
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—226

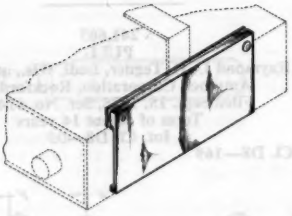


241,612
MOUNTING BRACKET FOR FLUID CONTROL VALVE OR SIMILAR ARTICLES
Stephen Matousek, and Ulrich H. Koch, Moraga, Calif., assignors to Whitey Research Tool Co., Emeryville, Calif.
Filed May 19, 1975, Ser. No. 578,409
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—233

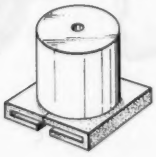


241,613
MOUNTING BRACKET FOR FLUID CONTROL VALVE OR SIMILAR ARTICLES
Stephen Matousek, and Ulrich H. Koch, Moraga, Calif., assignors to Whitey Research Tool Co., Emeryville, Calif.
Filed May 19, 1975, Ser. No. 578,756
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—233

241,614
SECURITY DEVICE FOR MOBILE TRANSCEIVERS OR THE LIKE
Jimmy D. Wallace, 800 Beckford Court W., Hurst, Tex. 76053
Filed June 4, 1975, Ser. No. 583,581
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—233



241,615
CONNECTOR FOR SUSPENDING PANELS OR THE LIKE FROM CEILINGS
Donald G. King, 241 Dickson Park Crescent, Mississauga, Ontario, Canada
Filed Dec. 2, 1974, Ser. No. 528,701
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—235



241,616
MASTER LINK
Kenneth D. Schreyer, Clarence, and Edward R. Behnke, Lockport, N.Y., assignors to Columbus McKinnon Corporation, Tonawanda, N.Y.
Filed Mar. 10, 1975, Ser. No. 556,656
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—261

241,617
EXPANSIBLE ANCHOR BOLT
Illar Toomingas, Enskede, Sweden, assignor to Telefonaktiebolaget L. M. Ericsson, Stockholm, Sweden
Claims priority, application Sweden Mar. 19, 1975
Filed Sept. 2, 1975, Ser. No. 609,363
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—272

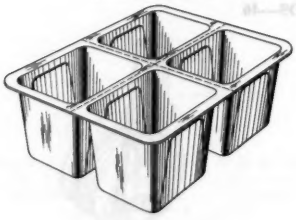
241,618
EXPANSIBLE ANCHOR BOLT
Illar Toomingas, Enskede, Sweden, assignor to Telefonaktiebolaget L. M. Ericsson, Stockholm, Sweden
Claims priority, application Sweden Mar. 19, 1975
Filed Sept. 5, 1975, Ser. No. 610,614
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—272

241,619
STORAGE CONTAINER FOR LIQUIDS OR THE LIKE
George W. MacFarlane, 504 Richmond St., Orlando, Fla. 32806
Filed Oct. 1, 1973, Ser. No. 402,033
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—46

241,620
BOTTLE
Victor Koenigsberg, Franklin Square, N.Y., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Apr. 10, 1975, Ser. No. 566,897
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—116

241,621
COMBINED SAFETY CAP AND TEMPORARY STOPPER FOR A CONTAINER
Glenn H. Morris, 4203 Highwood Drive, Chattanooga, Tenn. 37415
Filed May 24, 1973, Ser. No. 363,638
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—281

241,622
PACKAGING CONTAINER HAVING SEVERABLY CONNECTED CONTAINER COMPARTMENTS
Ernest L. Smith, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed June 28, 1974, Ser. No. 484,268
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—184



241,623
POURING ATTACHMENT FOR A CONTAINER
Emett O. Meeks, P.O. Box 10493, Midwest City, Okla. 73110
Filed Feb. 21, 1975, Ser. No. 551,885
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—290

241,624
POURING SPOUT
David H. Trott, Cincinnati, Ohio, assignor to Crossbow, Inc., Cincinnati, Ohio
Filed Apr. 25, 1975, Ser. No. 571,755
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—290

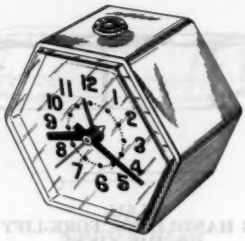
241,625
CLOCK OR SIMILAR ARTICLE
James O. O'Brien, 2101 Hawk Lane, Rolling Meadows, Ill. 60008
Filed Mar. 3, 1975, Ser. No. 554,648
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—8

241,626
DIGITAL CLOCK
Andrew Durco, Jr., 7463 Brentcove Circle, Dallas, Tex. 75214
Filed Feb. 11, 1974, Ser. No. 441,264
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15

241,627
LINEAR CLOCK
James R. Bailey, 4020 N. Pioneer Ave., Chicago, Ill. 60634
Filed Apr. 25, 1975, Ser. No. 571,648
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15

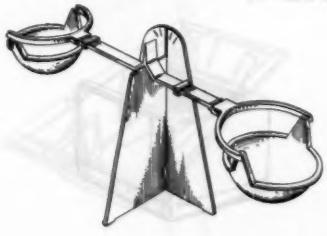
241,628
LINEAR CLOCK
James R. Bailey, 4020 N. Pioneer Ave., Chicago, Ill. 60634
Filed Apr. 25, 1975, Ser. No. 571,649
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15

241,629
CLOCK OR SIMILAR ARTICLE
Arthur M. Felske, Westport, Conn., assignor to General Electric Company
Filed May 7, 1975, Ser. No. 575,191
Term of patent 7 years
Int. Cl. D10—*01*
U.S. Cl. D10—21



241,630
DIGITAL WRISTWATCH
Roger A. Burke, Laguna Beach, and Paul J. Clemmer, Mission Viejo, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.
Filed Dec. 16, 1974, Ser. No. 532,810
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—32

241,631
BALANCE SCALE
Deborah J. Gleason, Norfolk, Mass., assignor to Zerox Corporation, Stamford, Conn.
Filed Oct. 11, 1974, Ser. No. 513,920
Term of patent 14 years
The term of this patent subsequent to Sept. 30, 1989, has been disclaimed
Int. Cl. D10—*04*
U.S. Cl. D10—90



241,632
ISLAND CANOPY
Eliot F Noyes, New Canaan, Conn., assignor to Mobil Oil Corporation
Filed June 10, 1974, Ser. No. 477,956
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—56

241,633
OPERATING HANDLE FOR FORK-LIFT TRUCK, OR THE LIKE
Rune G. Mono, Taby, Sweden, assignor to AB Byggoch Transportekonomi (BT), Bromma, Sweden
Original design application Feb. 13, 1973, Ser. No. 332,177, now abandoned. Divided and this application Feb. 12, 1975, Ser. No. 549,482
Claims priority, application Sweden Aug. 17, 1972
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—174

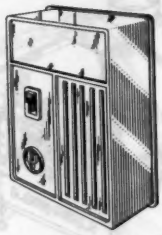
241,634
INSULATING INSERT FOR A BUILDING BLOCK OR THE LIKE
David Nickerson, Wilbraham, Mass., assignor to Korfil, Inc., Chicopee, Mass.
Filed Jan. 27, 1975, Ser. No. 544,666
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—98

241,635
WRITING INSTRUMENT
Donald J. Kuntz, Box 43, Sullivan Road, Aurora, Ill. 60504
Filed Jan. 4, 1974, Ser. No. 430,745
Term of patent 3½ years
Int. Cl. D19—*06*
U.S. Cl. D19—42

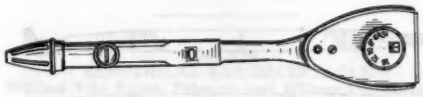
241,636
BOW NOCK
Marc G. Wood, Ogden, Utah, assignor to Browning Arms Company, Morgan, Utah
Filed Dec. 1, 1975, Ser. No. 636,674
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—12

241,637
INSECT TRAP
Emil Krush, Winnipeg, Manitoba, and Roger Boulanger, Calgary, Alberta, Canada, assignors to Alladin Enterprises Ltd., Winnipeg, Manitoba, Canada
Filed Apr. 8, 1975, Ser. No. 566,077
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—19

241,638
MOSQUITO REPELLER
Earl W. Holt, 6731 Hillwood Lane, Dallas, Tex. 75224
Filed Aug. 25, 1975, Ser. No. 607,477
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—19



241,639
COMBINATION FISHING ROD HANDLE AND RADIO
John A. Francis, 3720 Morgan Drive, Weirton, W. Va. 26062
Filed Apr. 8, 1975, Ser. No. 567,143
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—26

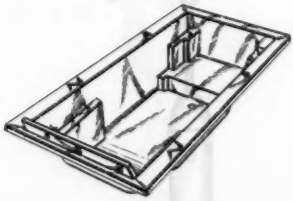


241,640
FISHING LURE
Gary R. Miralles, 300 W. Blake St., Yreka, Calif 96097
Filed July 7, 1975, Ser. No. 593,630
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

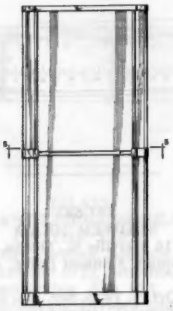
241,641
FISH SCALER
Daniel H. Brown, 107 S. Jonesville Blvd., Jonesville, N.C. 28642, and Joseph R. Brown, P.O. Box 6273, Greensboro, N.C. 27405
Filed Apr. 24, 1975, Ser. No. 571,277
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—31

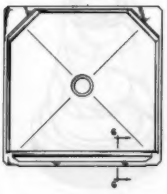
241,642
SHOWER HEAD
John B. Arpin, 1716 Melville St., Ocean, N.J. 07712, and Samuel L. Feldman, 3 Sunset Drive, Asbury Park, N.J. 07712
Filed Oct. 9, 1975, Ser. No. 621,160
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35

241,643
BATHTUB
Horst Godfrey Bonsack, London, England, assignor to Bonsack Baths Limited, London, England
Filed Sept. 29, 1975, Ser. No. 617,645
Claims priority, application United Kingdom Apr. 14, 1975
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—55



241,644
SHOWER STALL
Richard W. Van Riper, Jr., Crawfordsville, Ind., assignor to Ingress Manufacturing Company, Inc.
Filed Sept. 11, 1975, Ser. No. 612,309
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—57

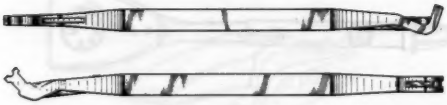




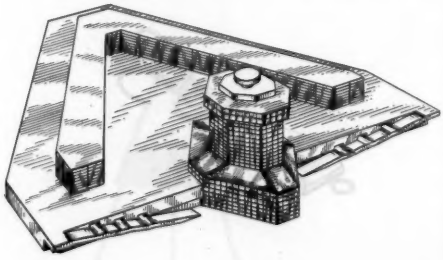
241,645
GAS LIGHTER
Ralph Lanzi, 108 St. Stephens Place, Staten Island, N.Y. 10306
Filed Nov. 6, 1975, Ser. No. 629,651
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—90.1

241,646
HEATER
Wilbur E. Lilly and David A. Rogers, Mount Gilead, Ohio, assignors to Lilly Industries, Inc.
Filed July 24, 1975, Ser. No. 598,719
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—93

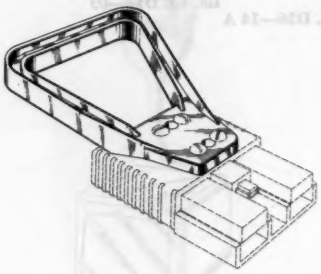
241,647
ORTHODONTIC BAND CHECKER INSTRUMENT
Albert P. Ruggieri, Flourtown, Pa., assignor of fractional part interest to Bernard D. Stalnaker, Philadelphia, Pa.
Filed Apr. 28, 1975, Ser. No. 572,003
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—1 D



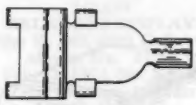
241,648
AIRPORT
John W. Magill, 700 N. Michigan Ave., Chicago, Ill. 60611
Filed Mar. 6, 1975, Ser. No. 555,982
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—3



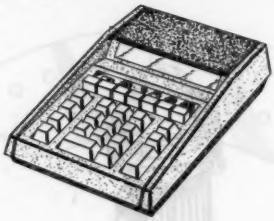
241,649
HANDLE FOR ELECTRICAL CONNECTORS
Herbert Hamilton Andersen, Jr., 140 Highplain Road, Andover, Mass. 01810, and Stephen Anthony Machcinski III, 19 Seymour St., Winthrop, Mass. 02152
Filed Dec. 19, 1974, Ser. No. 534,549
Term of patent 14 years
Int. Cl. D7—*02*; D8—*07*; D13—*03*
U.S. Cl. D26—1 R



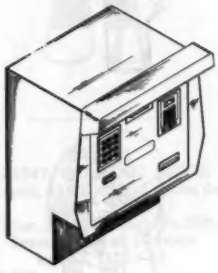
241,650
ELECTRICAL TAB RECEPTACLE
William Vito Pauza, Palmyra, and Wilmer Lee Sheesley, Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Original design application Jan. 7, 1974, Ser. No. 431,178. Divided and this application Feb. 4, 1975, Ser. No. 546,961
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 A



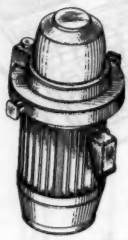
241,651
CALCULATOR
Steven G. Hauser, Tarzana, Calif., assignor to Addmaster Corporation, San Gabriel, Calif.
Filed May 17, 1973, Ser. No. 353,993
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D26—5 C



241,652
BANKING MACHINE TERMINAL
Edward H. McCauley, Dallas, and Lewis J. O'Kelly, Fort Worth, Tex., assignors to Docutel Corporation, Irving, Tex.
Filed Mar. 10, 1975, Ser. No. 557,048
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

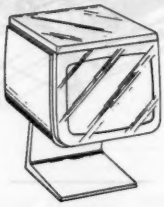


241,653
DYNAMOELECTRIC MACHINE
Robert F. Gleichman, San Jose, Calif., assignor to General Electric Company
Filed Aug. 7, 1975, Ser. No. 602,624
Term of patent 14 years
Int. Cl. D13—*01*
U.S. Cl. D26—5 A

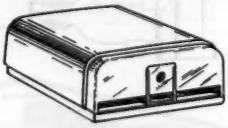


241,654
CORDLESS TAPE WINDER
Donald A. Burns, Putnam Valley, N.Y., assignor to Donald A. Burns
Filed Feb. 13, 1975, Ser. No. 549,710
Term of patent 14 years
Int. Cl. D14—*99*; D16—*05*
U.S. Cl. D26—14 B

241,655
VIDEOTELEPHONE RECEIVER
Donald Michael Genaro, Haworth, and Thomas Joseph Kelly, Middletown, N.J., John Niel McGarvey, Drexel Hill, Pa., and Daniel Wescoat Tyler, Middletown, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Original design application Oct. 15, 1974, Ser. No. 514,401. Divided and this application June 25, 1975, Ser. No. 590,326
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A



241,656
VIDEOTELEPHONE TRANSMITTER
Donald Michael Genaro, Haworth, and Thomas Joseph Kelly, Middletown, N.J., John Niel McGarvey, Drexel Hill, Pa., and Daniel Wescoat Tyler, Middletown, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Original design application Oct. 15, 1974, Ser. No. 514,401. Divided and this application June 25, 1975, Ser. No. 590,335
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A

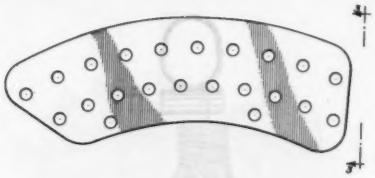


241,657
ASH TRAY
Shohichi Shinkai, 29, Kurumamichi-cho 4-chome, Higashi-ku, Nagoya, Aichi, Japan
Filed June 10, 1975, Ser. No. 585,584
Claims priority, application Japan Jan. 27, 1975
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D27—12

241,658
GAS-LIGHTER
Alain Huguet, Lyon, and Marcel Vache, Sainte-Foy-les-Lyon, France, assignors to Application Des Gaz, Paris, France
Filed Feb. 24, 1975, Ser. No. 552,386
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—39

241,659
RELIGIOUS DISPLAY
Wiley H. Dill, 2002 Gail Ave., Albany, Ga. 31705
Filed Feb. 22, 1973, Ser. No. 334,946
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—157

241,660
CUVETTE HOLDER
Dennis F. Shine, Huntington Beach, Calif., John C. Wilson, Cleveland, Ohio, and Michael E. Witty, El Toro, Calif., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Filed Oct. 17, 1974, Ser. No. 515,761
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D32—2 C



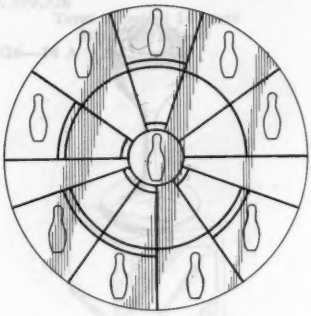
241,661
TOY STUFFED DOG
Thomas J. Dawson, St. Louis, Mo., assignor to Genie Toys, Inc.
Filed June 20, 1975, Ser. No. 588,667
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—2 R

241,662
GAME PLAYING PIECE
Tim Radmall, 431 Dahlia, Corona del Mar, Calif. 92625
Filed Mar. 20, 1975, Ser. No. 560,471
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 GP

241,663
GAME PLAYING PIECE
Tim Radmall, 431 Dahlia, Corona del Mar, Calif. 92625
Filed Mar. 20, 1975, Ser. No. 560,474
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 GP

241,664
COMBINED PLAYGROUND CLIMBER AND SLIDE
Ronald L. Ewers, Litchfield, Mich., and Ronald W. Zick, Minneapolis, Minn., assignors to The Toro Company, Minneapolis, Minn.
Filed Apr. 9, 1975, Ser. No. 566,381
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 H

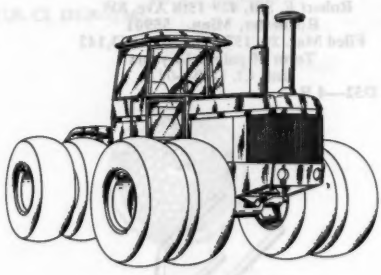
241,665
DART GAME BOARD
Ruhl H. Reed, 3006 Ridgeway Drive, Fort Wayne, Ind. 46816
Filed Apr. 21, 1975, Ser. No. 570,018
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 PP



241,666
CORSAGE HOLDER
Robert A. Shulkin, East 24122 Sprague Ave., Liberty Lake, Wash. 99012
Filed Apr. 23, 1975, Ser. No. 570,870
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—146

241,667
COMBINED FLOWER POT AND OVERFLOW DISH THEREFOR
Marten Gottsegen, 1212 Lake Shore Drive, Chicago, Ill. 60610
Filed May 16, 1975, Ser. No. 578,002
Term of patent 14 years
Int. Cl. D11—*2*
U.S. Cl. D11—152

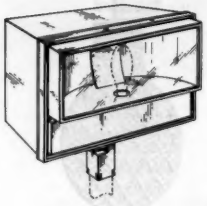
241,668
TRACTOR
John Donald Singer and Lawrence R. Beard, Waterloo, Iowa, and James Mervyn Conner, Mamaroneck, N.Y., assignors to Deere & Company, Moline, Ill.
Filed May 14, 1975, Ser. No. 577,560
Term of patent 14 years
Int. Cl. D12—*09*
U.S. Cl. D15—26



241,669
DIAMOND PENDANT
Alfred Joseph Durante, Forest Hills, N.Y., assignor to Cartier, Inc., New York, N.Y.
Filed Mar. 3, 1975, Ser. No. 554,606
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—81

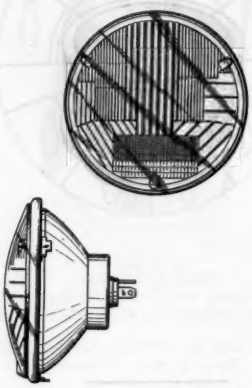
241,670
COMBINED LOUDSPEAKER AND LAMP BASE
Francis Joseph Walker, 23600 Lee Baker Drive, Southfield, Mich. 48075
Filed Apr. 29, 1975, Ser. No. 572,638
Term of patent 7 years
Int. Cl. D14—*01*; D26—*05*
U.S. Cl. D48—20 C

241,671
FLOODLIGHT
Giacinto C. D'Ercoli, Rolling Meadows, Ill., and James P. Kelly, Cudahy, Wis., assignors to McGraw-Edison Co., Elgin, Ill.
Filed Oct. 10, 1975, Ser. No. 621,410
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—20 K



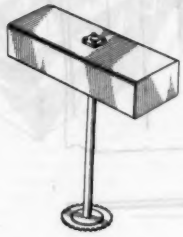
241,672
FLASHLIGHT
Maynard Frank Wolfe, Hong Kong, assignor to Prodev Limited, Hong Kong
Filed Apr. 23, 1975, Ser. No. 570,968
Claims priority, application Great Britain Jan. 17, 1975
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 A

241,673
SEALED BEAM HEADLIGHT
Pierre Cibie, Bobigny, France, assignor to Cibie Projecteurs, Bobigny, France
Filed Aug. 18, 1975, Ser. No. 605,474
Claims priority, application France Apr. 3, 1975
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32 R

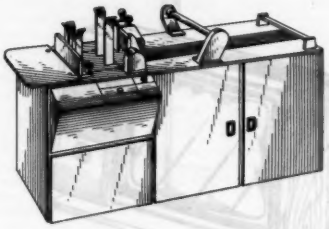


241,674
GUARD FOR COIN SLIDES
Robert E. Sill, 429 15th Ave. SW., Rochester, Minn. 55901
Filed Mar. 28, 1975, Ser. No. 563,142
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D52—4 R

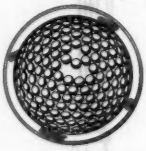
241,675
DISPERSING APPARATUS
Donald M. Schnear, Corona del Mar, Calif., assignor to Morehouse Industries, Inc., Fullerton, Calif.
Filed Oct. 16, 1974, Ser. No. 515,203
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—122



241,677
LABELING MACHINE
Jaroslaw Pacholok, Downers Grove, Ill., assignor to Bell & Howell Company, Chicago, Ill.
Filed Mar. 31, 1975, Ser. No. 563,558
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D15—145

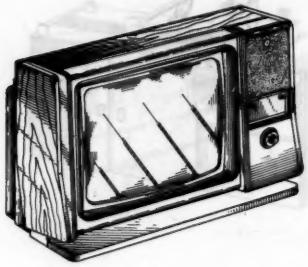


241,676
GOLF BALL MOLD
Francis deS. Lynch, Mattapoisett, John W. Jepson, Marion, and Robert A. Brown, Mattapoisett, Mass., assignors to Acushnet Company, New Bedford, Mass.
Filed Jun. 1, 1973, Ser. No. 365,862
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—136

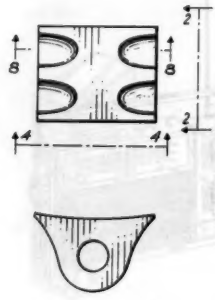


241,678
PORTABLE RADIO
Leonard Kaye, Westfield, N.J., assignor to Capehart Corporation, New York, N.Y.
Filed Nov. 25, 1974, Ser. No. 526,518
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B

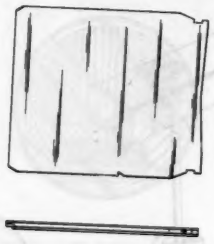
241,679
TELEVISION RECEIVER
Richard K. Althans, Long Grove, and Melvin H. Boldt, Glenview, Ill., assignors to Zenith Radio Corporation, Chicago, Ill.
Filed Apr. 18, 1975, Ser. No. 569,522
Term of patent 7 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 D



241,680
BINOCULAR ADJUSTMENT KNOB
Claus O. Huckenbeck, Sherman Oaks, Calif., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Apr. 30, 1975, Ser. No. 573,576
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—59

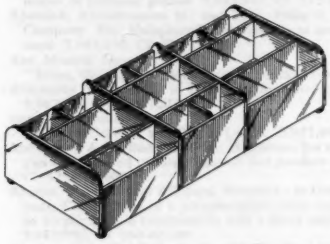


241,681
MICROFICHE CARRIER
Thomas R. Wells, Des Plaines, Ill., assignor to Bell & Howell Company, Chicago, Ill.
Filed Dec. 16, 1974, Ser. No. 532,808
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—26



241,682
OUTBOARD MOTOR
Goro Muto, Funabashi, and Kenji Fujie, Tokyo, Japan, assignors to Tanaka Kogyo Kabushiki Kaisha, Narashino-shi, Chiba, Japan
Filed June 23, 1975, Ser. No. 589,264
Claims priority, application Japan Dec. 27, 1974
Term of patent 14 years
Int. Cl. D15—*01*
U.S. Cl. D15—4

241,683
COSMETIC VANITY CONTAINER
Rebecca Mark, 195 Turn of River Road, Stamford, Conn. 06905
Filed Apr. 10, 1975, Ser. No. 567,004
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 A



241,684
HAND MIRROR
Arnold Rose, Providence, R.I., assignor to Trina, Inc.
Filed June 30, 1975, Ser. No. 591,441
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Int. Cl. D28—*03*
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TO WHOM

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Bargenda, Siegfried, to Audi NSU Auto Union Aktiengesellschaft; and Wankel GmbH. Ignition system for a rotary piston combustion engine. 3,982,502, Cl. 123-8.090.

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Harrison, Charles W.; Mead, Theodore C.; Moreland, Howard R.; and Barger, Frank L., 3,982,422.

Barlow, Michael L., to United States of America, Navy. Tuned plate acoustic projector with piezoelectric driver. 3,983,425, Cl. 310-8.700.

Barnhart, Donald M.; and Carpenter, James H., Jr., to Carborundum Company, The. Sand lump grinder. 3,982,702, Cl. 241-58.000.

Barrett, Joseph Edward, to British Petroleum Company Limited, The. Method of molding reinforced articles. 3,983,205, Cl. 264-254.000.

Bartlett, Richard F.; and Case, Laura K., to Itek Corporation. Electrophotographic copying process. 3,982,935, Cl. 96-1.00R.

Bartolucci, Edgar O., to Instore Advertising, Inc. False fingernail kit. 3,982,551, Cl. 132-73.000.

Baruffini, Agostino: *See—*
Arsura, Emilio; Baruffini, Agostino; Gialdi, Franco; Pellegrini, Giovanni; Ponci, Riccardo; and Scrivani, Pietro, 3,982,931.

BASF Aktiengesellschaft: *See—*
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Rauch, Konrad; Kiefer, Hans; Hesse, Dieter; Strohmeyer, Max; and Hohenschutz, Heinz, 3,983,010.
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Scheuermann, Horst; and Mach, Wolfgang, 3,983,117.

Bashaw, Robert Niles; and Atkins, Bobby Leroy, to Dow Chemical Company, The. Absorbent fibers and process for their preparation. 3,983,095, Cl. 526-15.000.

Bashkirov, Dmitry Vasilievich: *See—*
Pozdneev, Viktor Timofeevich; Khina, Mikhail Lvovich; Bashkirov, Dmitry Vasilievich; Judin, Nikolai Fedorovich; and Kobzev, Nikolai Sergeevich, 3,983,088.

Bass, Henry Herschel, to Unisearch Limited. Preparation of fertilizer and animal feed from molasses fermentation residue. 3,983,255, Cl. 426-54.000.

Bassett, Eugene E. Coil dispenser. 3,982,712, Cl. 242-129.000.

Bateman, John; and Gordon, David A., to Ciba-Geigy Corporation. Phenylindane diamine mixture and epoxy resin therewith. 3,983,092, Cl. 260-47.0EN.

Battelle Memorial Institute: *See—*
Conroux, Jean-Jacques; Pilet, Daniel; and Roehrich, Christian, 3,982,409.

Bauer, Werner R., to Robertshaw Controls Company. Electrical switch construction and method of making the same. 3,983,351, Cl. 200-83.00R.

Bauman, Joel: *See—*
Nichols, Herbert F., 3,983,415.

Bausch & Lomb Incorporated: *See—*
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Bayer Aktiengesellschaft: *See—*
Boden, Heinrich; and Knipp, Ulrich, 3,982,870.
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Buttner, Gerhard; Klauke, Erich; and Sasse, Klaus, 3,983,172.
Dieterich, Dieter; and Markusch, Peter, 3,983,081.
Konig, Hans-Bodo; Schrock, Wilfried; and Metzger, Karl Georg, 3,983,105.
Mansmann, Manfred; and Schmidt, Ludwig, 3,982,955.
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Bazin, Lucas John, to RCA Corporation. High efficiency deflection circuit. 3,983,452, Cl. 315-397.000.

BBC Brown Boveri & Company Limited: *See—*
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Bean, Lloyd F., to Xerox Corporation. Multiple layer migration imaging system. 3,982,939, Cl. 96-1.500.

Beatty, Theodore R.; and Vourlis, Harry, to Union Carbide Corporation. Alkaline cell with double collector positive, negative and third terminal connections. 3,982,966, Cl. 429-136.000.

Beaty, Robert C.: *See—*
Amos, Lynn G.; Bacus, James W.; Beaty, Robert C.; and Rogers, Charles H., 3,982,895.

Beck, David Ernest; and Thom, Derek Walter, to Imperial Chemical Industries. Yarn crimping process and apparatus. 3,982,310, Cl. 28-1.300.

Beck, David Walter. Folding boat propeller. 3,982,853, Cl. 416-142.000.

Beck, Otto: *See—*
Hamm, Klaus; and Beck, Otto, 3,982,991.

Becker, Rudolf, to Linde Aktiengesellschaft. Partition wall for tanker carrying cryogenic-temperature liquid. 3,982,653, Cl. 220-9.0LG.

Becker, Sylvester J. Portable wash stand. 3,982,284, Cl. 4-145.000.

Beckert, Werner F.: *See—*
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Beckmann, Georg: *See—*
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Bedford, John; and Sherrington, John Alexandre, to Ferranti, Limited. Pulse circuits. 3,983,496, Cl. 328-110.000.

Beeby, Philip J., to Syntex (U.S.A.) Inc. Cephalosporin type antibacterials. 3,983,113, Cl. 260-240.00R.

Beecham Group Limited: *See—*
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Thorne, David Edward; Baggaley, Keith Howard; and Morgan, Brian, 3,983,164.

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Behringwerke Aktiengesellschaft: *See—*
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Bell, Albert H., III, to General Motors Corporation. Gas turbine engine cooling system. 3,982,390, Cl. 60-39.16R.

Bell & Howell Company: *See—*
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Bell Telephone Laboratories, Incorporated: *See—*
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Bellino, Joseph A.; Geis, David G.; Hodne, Ingard B.; and Lindberg, Arthur F., to Teletype Corporation. Actuator mechanisms for wire matrix printers. 3,982,622, Cl. 197-1.00R.

Belluomo, Carl. Automatic cleaner. 3,982,297, Cl. 15-97.00R.

Benasutti, Louis D.: *See—*
Hanson, Robert S.; and Benasutti, Louis D., 3,982,406.

Bendall, Dennis M.; and Thorp, Peter M., to Rank Xerox Ltd. Electrostatographic copying machines. 3,982,832, Cl. 355-8.000.

Bendix Corporation, The: *See—*
Blanchard, William C.; and Kreiner, James E., Jr., 3,983,562.
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Rock, Michael H., 3,983,329.

Benkert, Donald E. Distribution valve for irrigation channels. 3,982,400, Cl. 61-24.000.

Bennett, Harry A. Cable and converter security device. 3,982,803, Cl. 339-37.000.

Benrud, Vernal M., to Sperry Rand Corporation. Switchable constant current sink. 3,983,453, Cl. 315-399.000.

Benson, Jay L.; and Hansen, Gordon J., to United States of America, Energy Research and Development Administration. Electromagnetic radiation detector. 3,983,437, Cl. 313-99.000.

Berkey Photo, Inc.: *See—*
Maltese, John; Nesson, Israel; and Mitchell, Robert, 3,983,570.

Berman, Donald J.: *See—*
Mark, Arnold; Berman, Donald J.; and Cohen, Sam, 3,983,447.

Bernard, James A., to General Motors Corporation. Magnetic control valve. 3,982,722, Cl. 251-4.000.

Bernard, James A.: *See—*
Heidorn, John H.; and Bernard, James A., 3,982,801.

Bernasconi, Felix; Brunner, Heinz; and Meylan, Pierre, to BBC Brown Boveri & Company Limited. Low pressure steam turbine construction. 3,982,849, Cl. 415-101.000.

Berry, James E.; and Straus, Andrew J. D., to Mobil Oil Corporation. Acoustical logging apparatus having signal delay means. 3,982,606, Cl. 181-102.000.

Berry, Robert N. Notching machine. 3,982,457, Cl. 83-516.000.

Berry, Thomas F.; Rajala, Ronald G.; and Mullins, Harold L., to General Electric Company. Friction welded metallic turbomachinery blade element. 3,982,854, Cl. 416-213.00R.

Berthiaume, Derek B., to Bralorne Resources Limited. Eccentric stabilizer. 3,982,594, Cl. 75-337.000.

Beverung, Warren Neil; and Partyka, Richard Anthony, to Bristol-Myers Company. Process for the preparation of optionally substituted 1,2,3,5-tetrahydroimidazo[2,1-b]quinazolin-2-ones. 3,983,120, Cl. 260-256.40F.

Beverung, Warren Neil, Jr.; Partyka, Richard Anthony; and Jenks, Thomas Andrew, to Bristol-Myers Company. Process for the preparation of optionally substituted 1,2,3,5-tetrahydroimidazo[2,1-b]quinazolin-2-ones. 3,983,119, Cl. 260-256.40F.

Bezemer, Jan Adrianus, to De Statt der Nederlanden, te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie. Filter chain. 3,983,518, Cl. 333-70.00R.

Biagi, Alvaro D.; Silbiger, Richard; and Orloff, Leslie, to Republic Electronic Industries, Inc. High frequency wave radiation system producing a rotating beam defining a predetermined geometrical pattern. 3,983,561, Cl. 343-787.000.

Bianchetta, Donald L., to Caterpillar Tractor Co. Apparatus for controlling work element operating pressures in a fluid system. 3,982,469, Cl. 91-412.000.

Bianchi, Rodolfo Edmundo; and Ueltschi De Bianchi, Olga Beatriz. Flexible portable dispensing container. 3,982,574, Cl. 150-9.000.

BICC Limited: *See—*
Waterhouse, Norman Howard, 3,982,403.

Bice, Charles D., to Westinghouse Electric Corporation. Method for connecting a tap assembly to an energized high-voltage cable. 3,982,319, Cl. 29-628.000.

Bidanset, Edward J., to Textron, Inc. Latch operated centrifugally released safety clutch for saws. 3,982,616, Cl. 192-104.00C.

Bieri, Hans. Heavy duty jig saw. 3,982,521, Cl. 125-16.00R.

Biermann, Udo Klaus Paul; Lynch, Brian; and van de Wijgert, Willibrordus Maria, to U.S. Philips Corporation. Method of manufacturing articles from metal coated with a zirconium nitride layer. 3,983,303, Cl. 428-457.000.

Billigmann, Joseph; Schneider, Christoph; Siewert, Johannes; and Sodeik, Manfred, to Rasselstein Aktiengesellschaft. Method for the manufacture of a cold-rolled steel strip in thin and super-thin metal plate thickness for producing stretch-formed cans or other deep-drawn parts. 3,982,968, Cl. 148-6.15R.

Bird, Thomas C.; and Paetzold, Walter J., to Corral Industries, Inc. Moisture reduction press. 3,982,483, Cl. 100-117.000.

Bird, Thomas Lewis: *See—*
Jones, Ivor Wynn; Robinson, Graham; and Bird, Thomas Lewis, 3,982,957.

Bisaillon, Jean-Pierre. Clutch release bearing monitoring device. 3,982,614, Cl. 192-30.00W.

Bitsch, Richard C.; and McCrary, Lawrence E., to Emerson Electrical Co. Interchangeable connector means for electric motor operation on either of two supply voltages. 3,983,428, Cl. 310-71.000.

Bituminous Coal Research, Inc.: *See—*
Saltsman, Robert D.; and Harris, Robert D., 3,982,330.

Blanchard, Clarence E., to Outboard Marine Corporation. Seal and isolation mounting system. 3,982,496, Cl. 115-.50S.

Blanchard, William C.; and Kreiner, James E., Jr., to Bendix Corporation, The. Mono-lobed scanner. 3,983,562, Cl. 343-815.000.

Blaupunkt-Werke GmbH: *See—*
Hegeler, Wilhelm, 3,983,497.

Blay, Jorge A., to Celanese Corporation. Recovery of vanadium and copper catalyst metals using ketones. 3,983,208, Cl. 423-27.000.

Blevins, Charles W.; and Protzman, Thomas F., to A. E. Staley Manufacturing Company. Method and apparatus for determining the pasting temperature of starch and the like. 3,982,420, Cl. 73-17.00R.

Blom, Ingvar Gustav Axel: *See—*
Ivarsson, Paul Lennart; and Blom, Ingvar Gustav Axel, 3,982,953.

Blommerde, Cornelis Wilhelmus Adrianus; Ridders, Johannes Antonius Maria; and Westerbeke, Huibregt, to U.S. Philips Corporation. Mercury vapor discharge lamp with mercury container in envelope exhaust tube. 3,983,439, Cl. 313-174.000.

Bloomfield, David P., to United Technologies Corporation. Pressurized fuel cell power plant with steam powered compressor. 3,982,962, Cl. 429-19.000.

Blumenfield, Arthur: *See—*
Kraynak, Joseph Stephen; and Blumenfield, Arthur, 3,982,744.

BMT Manufacturing Corporation: *See—*
Vanderpool, Charles C., 3,982,377.

Boden, Heinrich; and Knipp, Ulrich, to Bayer Aktiengesellschaft. Apparatus for producing molded foam articles without defects. 3,982,870, Cl. 425-252.000.

Bodenseewerk Perkin-Elmer & Co. GmbH: *See—*
Tamm, Rolf Gunther Arnold, 3,982,834.

Boeing Company, The: *See—*
Kuehn, Riley, Jr., 3,982,987.

Boetto, Charles: *See—*
Stufflebeam, John F.; and Boetto, Charles, 3,982,773.

Boggio, Robert J., to Western Electric Company, Inc. In-line apparatus for electroplating a metal onto an article. 3,983,024, Cl. 204-198.000.

Bohman, Gote Bertil Sivert: *See—*
Wulker, Jan-Eric Lennart; and Bohman, Gote Bertil Sivert, 3,983,193.

Bolen, Robert J.: *See—*
Whitney, Paul V., Jr.; Bolen, Robert J.; and Cotter, William W., Jr., 3,983,357.

Boliver, Vincent J., to General Electric Company. Power cable separable connector having gasket means for restricting the flow of arc-generated gases therefrom. 3,982,812, Cl. 339-111.000.

Bolli, Hans-Ulrich, to SIG Schweizerische Industrie-Gesellschaft. Apparatus for transversely sealing a wrapper hose. 3,982,381, Cl. 53-180.00R.

Bonded Fibre Fabric Limited: *See—*
Elliott, Gordon Henry, 3,983,273.

Booth Fire Escape Ltd.: *See—*
Booth, Frederick, 3,982,608.

Booth, Frederick, to Booth Fire Escape Ltd. Fire escape. 3,982,608, Cl. 182-49.000.

Borbely, Gyula John; Illis, Alexander; and Brandt, Bernardus Jacobus, to International Nickel Company, Inc., The. Purification of nickel electrolyte by electrolytic oxidation. 3,983,018, Cl. 204-130.000.

Borg-Warner Corporation: *See—*
Aubel, John A.; and Reinke, Ronald E., 3,982,555.
Reed, David F., 3,982,615.

Borne, Mel. Night light toilet seat. 3,982,288, Cl. 4-237.000.

Borsatti, Mario: *See—*
Murer, Angelo; and Borsatti, Mario, 3,983,295.

Bos, Arie, to MacMillan Bloedel Limited. Vacuum lifting apparatus for cylindrical articles. 3,982,782, Cl. 294-64.00R.

Bose, Bimal K.; and Espelage, Paul M., to General Electric Company. Frequency insensitive sine wave-to-cosine wave converter. 3,983,494, Cl. 328-21.000.

Bossons, Walter Howard; and Langworthy, Colin George, to Masson Scott Thrissell Engineering Limited. Coarse/fine sheeter controls in particular and machine drive systems in general. 3,983,467, Cl. 318-593.000.

Botter nee Bergheaud, Fernande; Scaringella nee Desnoyer, Monique; and Wacongne, Michel, to Commissariat a l'Energie Atomique. Separation of the mercury isotopes by the indirect photochemical method. 3,983,019, Cl. 204-157.10R.

Bouplon, Edward J., to Chicago Pneumatic Tool Company. Air line lubricator. 3,982,609, Cl. 184-56.00A.

Bourlet, Maurice V., to Fabrique Nationale Herstal S.A. Device for handling cartridge magazines and suchlike. 3,982,676, Cl. 224-45.00R.

Boutle, David Leonard: *See—*
Cunningham, Victor Ralph; and Boutle, David Leonard, 3,982,335.

Bowman, Raymond Earl, to Co-Steel International Limited. Device for slitting billets. 3,982,455, Cl. 83-105.000.

Boyd, Douglas P., to Leland Stanford Junior University, The Board of Trustees of. Method and apparatus for X-ray or γ-ray 3-D tomography using a fan beam. 3,983,398, Cl. 250-445.00T.

Boys, John T., to Standard Pressed Steel Co. Apparatus for and method of determining rotational and linear stiffness. 3,982,419, Cl. 73-139.000.

Bozek, John S.; and Peyser, Harry A., to Continental Can Company, Inc. Easy opening container with retained closure. 3,982,658, Cl. 220-337.000.

BP Chemicals International Limited: *See—*
Hawkins, Edwin George Edward, 3,983,142.

Bradley, Daniel Joseph; and Hutchinson, Marcus Henry Ritchie, to National Research Development Corporation. Lasers. 3,983,508, Cl. 331-94.5PE.

Bradley, Frank M.; and Markle, Larry D. Sod laying machine. 3,982,711, Cl. 242-86.520.

Bradshaw, Cyril E., to Eaton Corporation. Exhaust gas recirculation control assembly. 3,982,515, Cl. 123-119.00A.

Braithwaite, David G.: *See—*
Allain, Ronald J.; and Braithwaite, David G., 3,983,224.

Braitinger, Helmut: *See—*
Schneider, Franz; and Braitinger, Helmut, 3,982,454.

Bralorne Resources Limited: *See—*
Berthiaume, Derek B., 3,982,594.

Bramley, Anthony; and Clabburn, Robin J. T. Netting. 3,983,280, Cl. 428-107.000.

Brandeis, Johann; and Kurze, Joachim, to BASF Aktiengesellschaft. Mixtures of methylolalkyl ureas and their butyl ethers. 3,983,043, Cl. 252-8.800.

Brandl, Rudolf; Moller, Tilo; Saile, Karl; and Streckfuss, Heinrich, to Heckler & Koch GmbH. Trigger mechanism for electrically ignited weapons. 3,982,347, Cl. 42-84.000.

Brandon, William D.: *See—*
Abraham, John C.; Grebner, Gary L.; Brandon, William D.; and Jero, John, 3,982,983.

Brandt, Bernardus Jacobus: *See—*
Borbely, Gyula John; Illis, Alexander; and Brandt, Bernardus Jacobus, 3,983,018.

Brann, Theodore L.: *See—*
Brumfield, Walter T.; Baker, Robert C.; and Brann, Theodore L., 3,983,311.

Branson, J. Howard. Knock down convertible toy. 3,982,352, Cl. 46-17.000.

Brass, Ronald William, to Deere & Company. Disengageable planter seed meter drive. 3,982,670, Cl. 222-177.000.

Brattle Instrument Corporation: *See—*
Phillipps, Patrick G., 3,982,528.

Brattsand, Ralph Lennart; Ekenstam, Bo Thuresson af; Claeson, Karl Goran; and Thalen, Bror Arne, to AB Bofors. Compositions and method of treating with stereoisomeric mixtures of 2-unsymmetrical 16,17-methylenedioxy steroids. 3,983,233, Cl. 424-241.000.

Braun, Morris; Gerty, John M., Jr.; and Spransy, George B., to W. Braun Company. Container and closure cap therefor. 3,982,651, Cl. 220-4.00B.

Breidenbach, Hans: *See—*
Gerresheim, Jost; Drennhaus, Alfons; Breidenbach, Hans; Mansour, Rodolf; and Pfeil, Christian, 3,982,600.

Brenzen, Timothy. Automatic kill switch assembly. 3,983,347, Cl. 200-157.000.

Bridgestone Tire Company Limited: *See—*
Inoue, Osamu; Abe, Masaru; and Tezuka, Toshiro, 3,982,580.
Tezuka, Toshiyata, 3,982,731.

Brink, Thomas E.; Chelin, Charles R.; and Thompson, Norman D., to Towmotor Corporation. Container handling attachment. 3,982,645, Cl. 214-620.000.

Bristol-Myers Company: *See—*
Beverung, Warren Neil; and Partyka, Richard Anthony, 3,983,120.
Beverung, Warren Neil, Jr.; Partyka, Richard Anthony; and Jenks, Thomas Andrew, 3,983,119.

British Petroleum Company Limited, The: *See—*
Barrett, Joseph Edward, 3,983,205.

Britt, Edward J.: *See—*
Rasor, Ned S.; and Britt, Edward J., 3,983,423.

Brown, Harold J., to Lorain Products Corporation. Controlled reactance regulator circuit. 3,983,469, Cl. 321-9.00R.

Brown, Patrick R.: *See—*
Haldimann, Hans Rudolf; Buehler, Max; and Brown, Patrick R., 3,982,639.

Brown, Richard E.; Puchalski, Chester; and Shavel, John, Jr., to Warner-Lambert Company. Substituted benzopyranopyridine. 3,983,110, Cl. 260-247.20B.

Browning Arms Company: *See—*
Browning, Val A., 3,982,468.

Browning, Howard Edmund, to Imperial Chemical Industries Limited. Method for the production of polytetrafluoroethylene moulding powders. 3,983,200, Cl. 264-117.000.

Browning, Val A., to Browning Arms Company. Piston and obturator assembly for autoloading firearms. 3,982,468, Cl. 89-193.000.

Brumfield, Walter T.; Baker, Robert C.; and Brann, Theodore L., to Square D Company. Auxiliary gutter with lay-in end walls and universal cover. 3,983,311, Cl. 174-50.000.

Brunner, Heinz: *See—*
Bernasconi, Felix; Brunner, Heinz; and Meylan, Pierre, 3,982,849.

Brunner, Ronald H. M.; Jensen, Billy M.; and Wong, Lang S., to China Bazaar, Inc. Automatic fortune cookie folding method. 3,983,262, Cl. 426-502.000.

Brute, Inc.: *See—*
Burchett, Lawrence; and Adams, Vernon, 3,982,695.

Bublitz, Arthur T.; and Holben, Eugene F., to Reliance Electric Company. Adjustable valve assembly. 3,982,726, Cl. 251-133.000.

Bucalo, Louis. Dynamic implants and method for implanting the same. 3,982,537, Cl. 128-260.000.

Bucci, Archangelo Joseph, to Lawrence Peska Associates, Inc., a part interest. Combination lantern. 3,983,384, Cl. 240-37.000.

Buchalter, Gilbert. Stable dialdehyde-containing disinfectant compositions and methods. 3,983,252, Cl. 424-333.000.

Buchel, Karl Heinz; Plempel, Manfred; and Kramer, Wolfgang, to Bayer Aktiengesellschaft. Compositions and method for treating mycoses. 3,983,240, Cl. 424-269.000.

Buchoff, Leonard S.; Kosiarski, Joseph P.; and Dalamangas, Chris A., to Technical Wire Products, Inc. Method of making electrically conductive connector. 3,982,320, Cl. 29-630.00R.

Buckle, Derek Richard; Smith, Harry; and Cantello, Barrie Christian Charles, to Beecham Group Limited. Substituted ω-nitroacetophenones. 3,983,156, Cl. 260-471.00R.

Buckman, Thomas P. Intravenous administration system. 3,982,534, Cl. 128-214.00C.

Bud Antle, Inc.: *See—*
Abey, John A., 3,982,875.

Budd Company, The: *See—*
Leavesley, George W.; and Cleavenger, Dever C., 3,982,418.

Budge, James D. Wind-propelled skateboard. 3,982,766, Cl. 280-1.000.

Budrys, Vitolis: *See—*
Wilson, Phillip M.; Erickson, John W.; Nelson, Charles C.; and Budrys, Vitolis, 3,982,589.

Buehler, Max: *See—*
Haldimann, Hans Rudolf; Buehler, Max; and Brown, Patrick R., 3,982,639.

Buffington, Donald R., to Anning-Johnston Company. Wall system having detachable wall panels and a method of assembling same. 3,982,370, Cl. 52-481.000.

Bundy, Gordon L., to Upjohn Company, The. 4-Oxa phenyl-substituted PGF compounds. 3,983,157, Cl. 260-473.00A.

Bundy, Gordon L., to Upjohn Company, The. 3-Oxa phenyl-substituted PGA compounds. 3,983,158, Cl. 260-473.00A.

Burchett, Lawrence; and Adams, Vernon, to Brute, Inc. Steam producing device. 3,982,695, Cl. 239-136.000.

Burgin, Gerard; and Klingler, Adolf. Chair or armchair. 3,982,786, Cl. 297-284.000.

Burnham, Peter B., to Harsco Corporation. Dock leveling apparatus. 3,982,295, Cl. 14-71.500.

Burnham, Robert D.: *See—*
Scifres, Donald R.; and Burnham, Robert D., 3,983,509.

Burns Foods Limited: *See—*
Kompan, Louis, 3,982,299.

Burroughs Corporation: *See—*
Faber, Ulbe; Davis, Robert L.; Fisher, David A.; and McGonagle, Joseph D., 3,983,539.
Faber, Ulbe; Davis, Robert L.; Fisher, David A.; and McGonagle, Joseph D., 3,983,541.
Lacher, William Arthur, 3,983,324.
Maitrias, Gerard, 3,983,468.

Bury, Fred, to Singer Company, The. Yarn jerker system for tufting machines. 3,982,490, Cl. 112-79.00R.

Bush, John A.; Lance, Drew R.; and Altstatt, John E., to California Microwave, Inc. Frequency-modulation demodulator threshold extension device. 3,983,488, Cl. 325-346.000.

Bussi, Giancarlo; and Baradel, Pierpaolo, to Aquila S.p.A. Orthophosphoric esters and process for producing same. 3,983,098, Cl. 260-963.000.

Buttner, Gerhard; Klauke, Erich; and Sasse, Klaus, to Bayer Aktiengesellschaft. Bis-halogen carbonyl anilines and process for the production. 3,983,172, Cl. 260-544.00C.

Byrd, William J., to Salk Institute for Biological Studies, The. Multiple sample pipetting apparatus. 3,982,438, Cl. 73-425.600.

Cabaraux, Emile; and Schoberle, Robert, to Solvay & Cie. Electrolytic cells with vertical electrodes. 3,983,026, Cl. 204-258.000.

Cabot Corporation: *See—*
Venal, Wilfredo V.; Klein, H. Joseph; Daniel, Richard R.; and Gross, Rodney T., 3,982,925.

Cailloux, Paul, to Promecam Sisson-Lehmann. Device for controlling a movable member on a machine tool. 3,982,417, Cl. 72-453.010.

Cain, Robert L., to Robinair Manufacturing Corporation. Vacuum pump. 3,982,864, Cl. 418-149.000.

Cairati, Luciano: *See—*
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Calhoun, Harry C.; Freed, Larry E.; and Kaufman, Carl L., to International Business Machines Corporation. Multilayer insulation integrated circuit structure. 3,982,316, Cl. 29-577.000.

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Campagnolo, Tullio. Conical shaped disc brake for a vehicle. 3,982,610, Cl. 188-18.00A.
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Caron, Charles A. Jet-propelled power boat. 3,982,497, Cl. 115-70.000.
Carpenter, Charles W., to Hercules Incorporated. Method and apparatus for making pile fabric. 3,982,978, Cl. 156-72.000.
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Caspi, Amiram; and Kahn, Michael N., to Sci-Tex Corporation Ltd. Textile machine controller. 3,983,370, Cl. 235-151.100.
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Choate, Frank J., Jr. Portable power operated pipe wrench. 3,982,449, Cl. 81-57.180.
Chodnekar, Madhukar Subraya; Schwieter, Ulrich; Loeliger, Peter; Pfiffner, Albert; Suchy, Milos; and Zurfluh, Rene, to Hoffmann-La Roche Inc. 2,4-Dodecadienoic acid esters and use for insecticides. 3,983,247, Cl. 424-312.000.
Chong, Clyde H. H.; Love, Calvin M.; Prisc, Martin D.; and Russo, Alexander J., to United States of America, Energy Research and Development Administration. High purity polonium recovery. 3,983,219, Cl. 423-249.000.
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Cline, Carl F.; and Morris, Robert C., to Allied Chemical Corporation. Doped beryllium lanthanate crystals. 3,983,051, Cl. 252-301.40R.
Cline, Edwin Lee, to Clayton Manufacturing Company. Computer type brake analyzer. 3,982,429, Cl. 73-126.000.
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Coggin, Charles H., Jr. Apparatus and method for controlling flooding in the drawing of glass fibers. 3,982,915, Cl. 65-1.000.
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Coleman, Kelly R. Display device with flexible face. 3,982,345, Cl. 40-132.00R.
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Colovas, Denny D.; Logan, John S.; and Mniece, Roland L., to Ford Motor Company. Velocity rate change sensitive fluid valve. 3,982,794, Cl. 303-24.00A.
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Conroux, Jean-Jacques; Pilet, Daniel; and Roehrich, Christian, to Battelle Memorial Institute. Weft-knitting method and apparatus. 3,982,409, Cl. 66-1.00R.
Console, Edward T.; Wilson, Anthony G.; and Lamandri, Joseph G. Food processing apparatus. 3,982,481, Cl. 99-477.000.
Continental Can Company, Inc.: *See—*
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Corbett, Joseph H., to Sherwood Medical Industries Inc. Method of making a catheter with an integral Luer lock means. 3,983,203, Cl. 264-150.000.
Cordaro, William, to International Business Machines Corporation. Random access memory read/write buffer circuits incorporating complementary field effect transistors. 3,983,543, Cl. 340-173.0FF.
Cordaro, William, to International Business Machines Corporation. Random access memory employing single ended sense latch for one device cell. 3,983,545, Cl. 340-173.0FF.
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Courtney, David O.; and Coats, Richard E., to Gates Rubber Company, The. One piece core and platform for endless tape cartridges. 3,982,701, Cl. 242-55.19A.
Courtney, James McNiven; Gilchrist, Thomas; and Dunlop, Eric Hutton, to University of Strathclyde, The. Coated adsorbent materials. 3,983,053, Cl. 252-430.000.
Coussot, Gerard, to Thomson-CSF. Surface acoustic wave device and method of manufacturing same. 3,983,514, Cl. 333-30.00R.
Cowardin, Robert L.; and Laurer, George J., to International Business Machines Corporation. Wand for reading optically encoded graphic symbols. 3,983,389, Cl. 250-227.000.
Cox, Jerome R., Jr.; and Snyder, Donald L., to Picker Corporation. Tomography system having axial scanning. 3,983,399, Cl. 250-445.00T.
Crawford, John T., to Towmotor Corporation. Steering axle. 3,982,604, Cl. 180-158.000.
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Cronson, Harry M., to Sperry Rand Corporation. Short pulse sequential waveform generator. 3,983,416, Cl. 307-260.000.
Croset, Michel, to Thomson-CSF. Flat connection for a semiconductor multilayer structure. 3,983,284, Cl. 428-195.000.
Cross, Edward A.; and Downer, John Douglas, to Texaco Inc. Stabilized dispersions of micronutrients in spray oils. 3,982,920, Cl. 71-1.000.
Crow, David E., to General Motors Corporation. Combustion apparatus. 3,982,392, Cl. 60-39.230.
Csakvary, Etienne; and Pascal, Andre, to Commissariat a l'Energie Atomique. Apparatus for non-traumatic determination of the mass and the position of the center of gravity of a body. 3,983,368, Cl. 235-151.300.
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Cunningham, Victor Ralph; and Boutle, David Leonard, to Porvair Limited. Shoe uppers. 3,982,335, Cl. 36-45.000.
Curl, Robert B. Multiple feed potato planter. 3,982,671, Cl. 222-178.000.
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Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See*—
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D'Amato, Salvatore F.; and Moss, Francis T., to American Bank Note Company. Method of assembling numbered documents in order. 3,982,453, Cl. 83-23.000.

Damico, Frank M., to Joerns Furniture Company. Bed frame locking assembly and method. 3,982,291, Cl. 5-294.000.

Dan River Inc.: *See*—
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Danke, Rudolph B., to Simplex Time Recorder Company. Time recorder having wheel alignment means. 3,983,568, Cl. 346-91.000.

Danzer, Paul M.; and Rae, Giles E., to United Technologies Corporation. Radar video clipping level derived from target signal. 3,983,556, Cl. 343-7.00A.

Darm, William J. Grease-collecting heat exchanger installation. 3,982,588, Cl. 165-165.000.

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de la Burde, Roger Z.; Aument, Patrick E.; Dawson, Ray F.; and Tamol, Ronald A., to Philip Morris Incorporated. Process for expanding tobacco. 3,982,550, Cl. 131-140.00P.

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De Anda, Nicholas; and Dyer, Robert Ford, to Mattel, Inc. Tape fastening system. 3,982,844, Cl. 403-211.000.

Dear, Peter Adrian; and Pelc, Wladyslaw, to Thorn Electrical Industries Limited. Discharge lamp ballast circuits. 3,983,449, Cl. 315-244.000.

DeCaro, Aristide R., to Westinghouse Electric Corporation. Incandescent lamp having a halogen-containing atmosphere and an integral reflector of non-reactive specular metal. 3,983,513, Cl. 313-113.000.

Decker, John M. Apparatus for working and testing solid elastomers. 3,982,427, Cl. 73-101.000.

Dedona, Francis A.: *See*—
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Gilpatrick, Michael William, 3,982,309.
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Clabburn, Robin James T.; Pettit, Maurice Raymond; and De Keermaecker, Guido, 3,982,564.

de Latour, Christopher, to Massachusetts Institute of Technology. Process for removing dissolved phosphorus from water magnetically. 3,983,033, Cl. 210-49.000.

DeLeon, Isrrael M.; and Thompson, Edward D., to Owens-Illinois, Inc. Thermoplastic injection runner transfer system. 3,982,632, Cl. 209-75.000.

Delerue, Dominique. Winding machines having independent spindles. 3,982,706, Cl. 242-18.100.

Delkor Industries, Inc.: *See*—
Klund, Robert N., 3,982,474.

Demag Aktiengesellschaft: *See*—
Reth, Erich; Varwig, Karl-Heinz; and Backhaus, Karl-Heinz, 3,982,439.

De Mayo, William D.: *See*—
Eldridge, John D.; and De Mayo, William D., 3,982,357.

Demessemaekers, Emiel Mathilde Anna Alfons: *See*—
Spadini, Gianfranco Luigi; and Demessemaekers, Emiel Mathilde Anna Alfons, 3,983,079.

de Moreau, Guy. Apparatus for constructing structures, particularly for children's playgrounds and gardens. 3,982,754, Cl. 272-113.000.

Denman, Dennis, to Matthias Spencer & Sons Limited. Coupling socket with releasable tool retainer. 3,982,842, Cl. 403-20.000.

Dennison, Richard Thomas; Freeman, Leo Boyes; Kelly, Helen Janet; and Liu, Peter Tsung-Shih, to International Business Machines Corporation. Split memory array sharing same sensing and bit decode circuitry. 3,983,544, Cl. 340-173.00R.

Denny, Dann W., to General Electric Company. Electrical switch. 3,983,349, Cl. 200-339.000.

Dentsply Research & Development Corporation: *See*—
Folkenroth, Richard P.; Mader, William G.; and Williams, Ralph J., 3,982,718.

Denver Plastics, Inc.: *See*—
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Denzel, Theodor: *See*—
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DePas, Laddie; and Wheeler, Stanley T., to W. M. Cissell Manufacturing Company. Pick off device. 3,982,623, Cl. 198-362.000.

De Pauw, Richard A.; and Gustafson, David J., to International Harvester Company. Helical element rotor-axial flow combine. 3,982,549, Cl. 130-27.00T.

DeRoo, Paul W., Sr. Method of manufacturing books. 3,982,743, Cl. 270-1.000.

Desaules, Jean-Jacques. Watches, and a method of making them. 3,982,386, Cl. 58-1.00R.

DeSoto, Inc.: *See*—
Sekmakas, Kazys, 3,983,059.

Det Norske Zinkkompani A/S: *See*—
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Deutsch, Ernst; and Reifenscheid, Bernhard, to Chemische Werke Huls Aktiengesellschaft. Modified structure for lining generally curved surfaces. 3,982,361, Cl. 52-80.000.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
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Deutsche Vergaser GmbH & Co. Kommanditgesellschaft: *See*—
Hartel, Gunter, 3,982,394.

Devoe, Donald R., to Leisure Technology, Inc. Jar filling funnel with level indicia. 3,982,570, Cl. 141-95.000.

DeVogelaere, George E. Cantilevered pellet backstop. 3,982,761, Cl. 273-102.400.

de Zabala, Edward Francis: *See*—
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Dhawan, Bhola Nath: *See*—
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Diamond, Julius; and Douglas, George H., to William H. Rorer, Inc. Ethynylindenyl compounds and derivatives thereof used in the treatment of pain, fever and inflammation. 3,983,253, Cl. 424-340.000.

Dibert, Fred. Ventilating apparatus for heat transfer systems. 3,982,560, Cl. 137-527.800.

Dick, G. John, to United States of America, Navy. Superconducting apparatus for generating high frequency microwaves. 3,983,470, Cl. 321-60.000.

Dick, Perry J.; and Dick, Perry J., Jr., to Trumbull Corporation. Material handling apparatus. 3,982,338, Cl. 37-102.000.

Dick, Perry J., Jr.: *See*—
Dick, Perry J.; and Dick, Perry J., Jr., 3,982,338.

Dickens, Elmer D., Jr., to B. F. Goodrich Company, The. Smoke retardant vinyl chloride and vinylidene chloride polymer compositions. 3,983,086, Cl. 260-23.0XA.

Dieball, Walter L. Electrical game apparatus. 3,982,764, Cl. 273-135.00A.

Dierks, James E.: *See*—
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Dieterich, Dieter; and Markusch, Peter, to Bayer Aktiengesellschaft. Inorganic-organic composition. 3,983,081, Cl. 260-2.5AJ.

Dietz, Paul L.: *See*—
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Diggs, Richard E. Heater for orchards and the like. 3,982,524, Cl. 126-59.500.

Digital Equipment Corporation: *See—*
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Dill, Douglas W., to S. C. Johnson & Son, Inc. Low temperature glazing composition. 3,983,060, Cl. 260-29.6RW.
Dillon, Leo H.: *See—*
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Dimitri, Dimitri S.: *See—*
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Doane, Russell C.: *See—*
Leis, Michael; and Doane, Russell C., 3,983,451.
Dockery, Benjamin F.; and Mason, Jack H. Apparatus for preparing furniture backs and cushions for tufting. 3,982,845, Cl. 408-1.00R.
Doherty, William H., to Bell Telephone Laboratories, Incorporated. Delayed pulse transmission systems. 3,983,482, Cl. 325-6.000.
Dojyo, Satoshi; and Yoshino, Tsutomu, to Toyo Kogyo Co., Ltd. Honing machine for finishing trochoidal bore of rotor housing of rotary engine. 3,982,356, Cl. 51-34.00J.
Donahue, Paul E.: *See—*
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Donovan, John S. Shift control system for multi-stage transmission. 3,983,405, Cl. 307-10.00R.
Donovan, William F., to United States of America, Army. Rotating cassette holder. 3,983,400, Cl. 250-468.000.
Dorfman, Edwin; Hindersinn, Raymond R.; and Schwartz, Willis T., Jr., to Hooker Chemicals & Plastics Corporation. Halogen containing polyester resins having improved smoke-resistance. 3,983,185, Cl. 260-863.000.
Dorr-Oliver Incorporated: *See—*
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Dorris, John P., to DDK Investments, Ltd. Frangible insert. 3,982,363, Cl. 52-98.000.
Dougherty, Harold F. Method and apparatus for drying grain. 3,982,329, Cl. 34-22.000.
Douglas, George H.: *See—*
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Dow Chemical Company, The: *See—*
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Bashaw, Robert Niles; and Atkins, Bobby Leroy, 3,983,095.
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Dual Fuel Systems, Inc.: *See—*
Abernathy, Kenneth T., 3,982,516.
Duenke, Milton J. Match book. 3,982,629, Cl. 206-106.000.
Dufour, Claude. Aryloxy pyridine carboxylic-4-acids. 3,983,126, Cl. 260-295.00R.
Dumbaugh, William H., Jr., to Corning Glass Works. Infrared detection system and windows used therein. 3,982,952, Cl. 106-47.00Q.
Duncan, Eugene F., to Cutler-Hammer, Inc. Limit switch operating shaft return spring damping device. 3,983,343, Cl. 200-47.000.
Dunlop, Eric Hutton: *See—*
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Dunlop Limited: *See—*
Wild, Hiram Leslie, 3,982,578.
Dunn, Neil C.: *See—*
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Du Pont de Nemours, E. I., and Company: *See—*
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Dyer, Robert Ford: *See—*
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Dynamics Research and Manufacturing, Inc.: *See—*
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Eaton, David L.; and Messing, Ralph A., to Corning Glass Works. Immobilized glucose isomerase. 3,982,997, Cl. 195-31.00F.
Ebauches S.A.: *See—*
Luscher, Jakob; and Rusznyak, Andreas, 3,983,411.
Ebauches Tavannes SA: *See—*
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Eckels, Robert E. Non-expendable positioning frame for multiple explosive charges. 3,982,486, Cl. 102-24.0HC.
Economics Laboratory, Inc.: *See—*
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Edel, William A.; and Regh, Joseph, to International Business Machines Corporation. Compensation of autodoping in the manufacture of integrated circuits. 3,982,974, Cl. 148-175.000.
Edwards, Melvin R.: *See—*
Tucker, Walter J.; Edwards, Melvin R.; and Tucker, Richard J., 3,982,781.
Eggers, James W. Injection molding apparatus with alternatively shuttled mold sections. 3,982,869, Cl. 425-246.000.
Ehrreich, Stewart J.; and Zitowitz, Lester, to Science Union et Cie Societe Francaise de Recherche Medical. Method for treating angina pectoris with certain N-arylsulfonyl-N'(aza-3-bicycloalkyl) ureas. 3,983,249, Cl. 424-321.000.
Eilers, Kenneth L.; and Kopacki, Adam F., to Stauffer Chemical Company. Process for preparing rigid PVC formulations. 3,983,186, Cl. 260-876.00R.
Eisenbach, Kurt, to Rheinische Chamotte und Dinas-Werke. Apparatus for making plate elements. 3,982,876, Cl. 425-501.000.
Ekenstam, Bo Thuresson af: *See—*
Brattsand, Ralph Lennart; Ekenstam, Bo Thuresson af; Claeson, Karl Goran; and Thalen, Bror Arne, 3,983,233.
Elbel, Karl; and Wolfinger, Kurt, to ROC A.G. Abrasive member of bonded aggregates in an elastomeric matrix. 3,982,359, Cl. 51-295.000.
Elcik, Robert G., to Stauffer Chemical Company. Fire retardant polyvinyl chloride containing compositions. 3,983,290, Cl. 428-285.000.
Eldridge, John D.; and De Mayo, William D. Cleaning device for cauterizing knives. 3,982,357, Cl. 51-181.00R.
Electricity Council, The: *See—*
Jones, Ivor Wynn; Robinson, Graham; and Bird, Thomas Lewis, 3,982,957.
Electron Beam Microfabrication Corporation: *See—*
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Elliott, Gordon Henry, to Bonded Fibre Fabric Limited. Carding machines. 3,983,273, Cl. 427-430.000.
Ellis, Richard B., Jr.; and Wilson, James R., to General Motors Corporation. Rotary selector switch. 3,983,352, Cl. 200-11.00J.
Ellner, Milan: *See—*
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Ellsworth, Arthur C.; and Carlin, William W., to PPG Industries, Inc. Method of preparing chromium. 3,983,016, Cl. 204-89.000.
Elrick, Donald E.; and Gilbert, Harry, to Hercules Incorporated. Propellants having improved resistance to oxidative hardening. 3,982,975, Cl. 149-19.900.
Emco Wheaton Inc.: *See—*
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Emerson Electric Co.: *See—*
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Emerson Electrical Co.: *See—*
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Endo, Akira; Kuroda, Masao; Terahara, Akira; Tsujita, Yoshio; and Tamura, Chihiro, to Sankyo Company Limited. Physiologically active substances. 3,983,140, Cl. 260-343.500.

Endo Laboratories, Inc.: *See—*
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Endo, Masao: *See—*
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Endzweig, Abraham. Connecting apparatus for frame members. 3,982,841, Cl. 403-19.000.

Energy Conversion Devices, Inc.: *See—*
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Rockstad, Howard K.; and Flasck, Richard A., 3,983,076.

Engelhard Minerals & Chemicals Corporation: *See—*
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Epstein, Martin: *See—*
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Epstein, Marvin Aaron, to International Telephone and Telegraph Corporation. Digital waveform generator. 3,983,495, Cl. 328-34.000.

Erdman, Charles A.: *See—*
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Erfurth, Henning: *See—*
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ESB Incorporated: *See—*
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Espelage, Paul M.: *See—*
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Esser, Hans-Helmut. Multi-functional furniture. 3,982,784, Cl. 297-1.000.

Eszakmagyarorszagi Vegyimuvek: *See—*
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Ethyl Corporation: *See—*
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Etter, Berwyn E. Method of flame cutting. 3,982,883, Cl. 432-13.000.

European Atomic Energy Community (Euratom): *See—*
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Evans, Arnold D. Loudspeaker cabinet having an integrally constructed horn. 3,982,607, Cl. 181-152.000.

Evans, Donald L.: *See—*
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Murer, Angelo; and Borsatti, Mario, 3,983,295.
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Eyre, Brian Leonard: *See—*
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Eysermans, Hubert, to Sprague Electric Company. Method for continuous assembly and batch molding of transistor packages. 3,982,317, Cl. 29-588.000.

Ezawa, Sadaaki: *See—*
Obayashi, Nobuharu; Hashizume, Hikaru; Sakashita, Noriji; Kameyama, Seiji; Ezawa, Sadaaki; Kugisawa, Toshio; Washiyama, Yutaka; Kondo, Tatsunori; and Watanabe, Hironori, 3,982,460.

F. L. Smidth & Co.: *See—*
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F. M. Wiest KG: *See—*
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Faber, Ulbe; Davis, Robert L.; Fisher, David A.; and McGonagle, Joseph D., to Burroughs Corporation. Polymorphic programmable units employing plural levels of sub-instruction sets. 3,983,539, Cl. 340-172.500.

Faber, Ulbe; Davis, Robert L.; Fisher, David A.; and McGonagle, Joseph D., to Burroughs Corporation. Polymorphic programmable units employing plural levels of phased sub-instruction sets. 3,983,541, Cl. 340-172.500.

Fabrique Nationale Herstal S.A.: *See—*
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Fafco Incorporated: *See—*
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Fairchild Camera and Instrument Corporation: *See—*
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Roberts, Gregory; and Badertscher, Roger, 3,983,412.
Stafford, Kenneth R.; and Guadagna, John P., 3,983,414.

Fales, Douglas I.; and Holl, William H., to General Motors Corporation. Closed loop carburetor air-fuel ratio control. 3,982,517, Cl. 123-122.00D.

Fang, Frank F., to International Business Machines - IBM. Analog waveform transducing circuit. 3,983,419, Cl. 307-277.000.

Fargo Mfg. Company, Inc.: *See—*
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Farlind, Stig Axel Goran, to Stece - AB Industrifjadrar. Safety belts. 3,982,769, Cl. 280-744.000.

Farmer, William Robert. Colorcode speller. 3,982,333, Cl. 35-36.000.

Farmery, Horstine. Applicators of granular materials. 3,982,672, Cl. 222-274.000.

Fattore, Vittorio; and Notari, Bruno, to Snam Progetti S.p.A. Catalytic composition and its applications to the production of unsaturated nitriles and to the oxidation of olefines. 3,983,054, Cl. 252-439.000.

Faulconer, Harry A. Electrical wire connector. 3,983,312, Cl. 174-84.00R.

Faulkner, Duane Harold; Sanford, Steven Douglas; and Chenoweth, Vaughn Charles, to Johns-Manville Corporation. Primary electrode arrangement for high temperature melting furnace. 3,983,309, Cl. 13-6.000.

Fazio, Rodolfo: *See—*
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Feedback Instruments Limited: *See—*
Lipscombe, William Mark, 3,983,512.

Feichtinger, Heinrich, to Leybold-Heraeus-Verwaltung G.m.b.H. Method and apparatus for degassing metallic melts. 3,982,913, Cl. 55-55.000.

Feichtner, John D., to Westinghouse Electric Corporation. Collinear acousto-optical tunable filter and acousto-optically tunable laser. 3,982,817, Cl. 350-149.000.

Feist, Wolfgang M.: *See—*
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Fellwock, Charles G.; and Russell, Charles R., to Whirlpool Corporation. Storage apparatus. 3,982,798, Cl. 312-138.00A.

Felton, George F., Jr., to Sun Oil Company of Pennsylvania. Low smoking lubricating composition for cold heading operations. 3,983,044, Cl. 252-33.600.

Feltrop, Floyd L. Seed planter for individual seeds. 3,982,661, Cl. 221-235.000.

Feng, Bai C.; Flachbart, Richard H.; Fried, Leonard J.; and Levine, Harold A., to International Business Machines Corporation. Lift-off method of fabricating thin films and a structure utilizable as a lift-off mask. 3,982,943, Cl. 96-38.400.

Fenton, David T.; and Swain, Leonard W., to Emco Wheaton Inc. Vapor recovery nozzle with mechanical flow interlock. 3,982,571, Cl. 141-225.000.

Ferber, Leon A.: *See—*
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Ferranti, Limited: *See—*
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Morrison, John Malcolm; and Stewart, Charles McGregor, 3,983,555.

Ferrario, Renzo: *See—*
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Ferre, Roy E.: *See—*
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Feyrer, Klaus; and Mueller, Wolfgang P., to R. Stahl Aufzuege GmbH. Clamping means for elevator guide rails and the like. 3,982,692, Cl. 238-349.000.

Fickelscher, Kurt Gerhard; and Anders, Christian Michael, to Balcke-Durr Aktiengesellschaft. Piston pump. 3,982,765, Cl. 277-53.000.

Fife, Rodger L., to Georgia-Pacific Corporation. Preparation of a wax containing paper sheet. 3,982,993, Cl. 162-158.000.

Filhaber, Ilmar J., to Fargo Mfg. Company, Inc. Dead front multi-tap terminal connector casing. 3,983,314, Cl. 174-138.00F.

Filippi, Ernest A.: *See—*
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Findley, John Eugene: *See—*
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Finger, John F., to Sioux Steam Cleaner Corporation. Seal in pump piston intermittently permitting conduction of pump fluid. 3,982,471, Cl. 92-156.000.

Finike Italiana Marposs-Soc. In Accomandita Semplice di Mario Possati & C.: *See—*
Pozzetti, Mario, 3,983,376.

Finzer, John O. Tubular roller sleeve. 3,982,312, Cl. 29-130.000.

Firehammer, John D.; and Gruebele, Dale W., to National Computer Systems, Inc. Apparatus utilizing analog-to-digital conversion in the photoelectric reading of documents. 3,983,364, Cl. 235-61.60E.

Fischer, Horst, to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Connection between a socket and a liquid cooled cable. 3,983,310, Cl. 174-19.000.

Fisher, David A.: *See—*
Faber, Ulbe; Davis, Robert L.; Fisher, David A.; and McGonagle, Joseph D., 3,983,539.
Faber, Ulbe; Davis, Robert L.; Fisher, David A.; and McGonagle, Joseph D., 3,983,541.

Fisher, Reed Edward; and Humes, Robert William, to Bell Telephone Laboratories, Incorporated. Frequency scan and lock circuit for mobile radio channel selection. 3,983,492, Cl. 325-468.000.

Fitch, Troy W., to Eagle Custom Manufacturing Company. Power take-off unit. 3,982,443, Cl. 74-15.880.

Fitzpatrick, Joseph W.: *See—*
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Flasck, Richard A.: *See—*
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Flatau, Abraham; Olson, Donald N.; and Miller, Miles C. Kinetic energy ring projectile. 3,982,489, Cl. 102-92.400.
Fleer, Ernst Otto, to Siemens Aktiengesellschaft. Arrangement for the switching on-and-off of a pressurized medium flow. 3,982,322, Cl. 32-22.000.
Fleer, Thomas P.: *See—*
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Focke, Heinz, to Focke & Pfuhl. Process and a device for wrapping articles, more particularly, groups of cigarettes. 3,982,375, Cl. 53-32.000.
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Folkenroth, Richard P.; Mader, William G.; and Williams, Ralph J., to Dentsply Research & Development Corporation. Operatory chair operating mechanism. 3,982,718, Cl. 248-421.000.
Ford, Freeman A.; and Rhodes, Richard O., to Fafco Incorporated. Pinch valve and method for fabrication. 3,982,723, Cl. 251-5.000.
Ford, John L.; and Serafin, John. Electroresectroscope and method of laparoscopic tubal sterilization. 3,982,542, Cl. 128-303.140.
Ford, John L. Medical stirrups. 3,982,742, Cl. 269-328.000.
Ford, Karl L., to Ball Corporation. Quick cooling pressure cooker system. 3,983,260, Cl. 426-403.000.
Ford Motor Company: *See—*
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Forteau, Lloyd H., to Standard Folding Cartons, Inc. Carton with pouring spout. 3,982,683, Cl. 229-17.00R.
Foster, Elton Gordon. Swimming pool cover. 3,982,286, Cl. 4-172.140.
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Frenken, Hans; Schindler, Georg; and Friedsam, Josef, to AGFA-Gevaert, A.G. Out-flow metering device. 3,982,665, Cl. 222-67.000.
Fricke, William C., to Sanders Associates, Inc. Normal incidence face pumped disc laser. 3,983,511, Cl. 331-94.50P.
Friebel, Eberhard, to Siemens Aktiengesellschaft. Fluid-volume measuring apparatus. 3,982,436, Cl. 73-233.000.
Fried, Leonard J.: *See—*
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Frieser, Rudolf G.; Powell, Jimmie L.; and Tummala, Rao R., to International Business Machines Corporation. Process for preparing a copper containing sealing glass. 3,982,918, Cl. 65-66.000.
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Gali Mallofre, Salvador. Washing machines for printing or processing tables. 3,982,485, Cl. 101-425.000.
Galin, Harry E., to Universal Vendors, Inc. Vending machine. 3,982,621, Cl. 194-1.00G.
Gambs, Paul Frederic Marie. Opthalmic instrument. 3,982,827, Cl. 351-14.000.
Gammie, Joseph E.; and Wanlass, Bert R., to General Motors Corporation. Rotary electric switch. 3,983,354, Cl. 200-155.00R.
Gannett, Danforth K., to Bell Telephone Laboratories, Incorporated. Key pulse generator for secrecy signalling circuit. 3,983,326, Cl. 179-1.50R.
Gannett, Danforth K.; and Norwine, Andrew C., to Bell Telephone Laboratories, Incorporated. Electrical signaling. 3,983,327, Cl. 179-1.50R.
Gannon, Jack Edward, to Girling Limited. Disc brake torque regulating structure. 3,982,611, Cl. 188-71.100.
Garcea, Giampaolo; Surace, Filippo; and Rogora, Edgardo, to Alfa Romeo S.p.A. Device for automatically adjusting the spark timing in an electronic ignition system for an explosion engine. 3,982,512, Cl. 123-117.00R.
Garcia Rodenas, Manuel. Etui for jewelry. 3,982,628, Cl. 206-45.140.
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Garriott, Eugene L. Snow moving apparatus. 3,982,337, Cl. 37-43.00L.
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Geck, Gunther; and Langhammer, Hans Jurgen, to Klockner-Werke AG. Method for melting charges. 3,982,926, Cl. 75-48.000.
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Gilli, Paul Viktor; and Beckmann, Georg, to Siempelkamp Giesserei KG. Steam-type peak-power generating system. 3,982,379, Cl. 60-659.000.
Gilmore, Guy T., to Multi-Fab, Inc. Facing tool. 3,982,451, Cl. 82-4.00C.
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Glorioso, Charles A., to Teletype Corporation. Astigmatizer for laser recording and reproducing system. 3,983,317, Cl. 178-6.60R.
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Goebel, Ronald C. Forming apparatus. 3,982,990, Cl. 156-443.000.
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Goldring, John E., to Jegco, Inc. Water conserving device for flushing apparatus. 3,982,283, Cl. 4-67.00A.
Goode, John Park, to ESB Incorporated. Electric power distribution system including a Master Annunicator and Central Control Unit. 3,983,554, Cl. 340-413.000.
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Gorton, Howard Bryon; and Miller, Warren Hall, to Ajax Hardware Corporation. Rotary-position catch for rotatable corner shelf units. 3,982,800, Cl. 312-305.000.
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Goswami, Jagadish C., to Stauffer Chemical Company. Method of making plastic foam laminates and product formed thereby. 3,983,294, Cl. 428-310.000.

Goszyk, Kurt A.; and Schaefer, Richard A., to Ford Motor Company. Motor vehicle fuel economy indicating circuit. 3,983,533, Cl. 340-52.00R.

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Grasso, Albert P., to United Technologies Corporation. Fuel cell stack with an integral ejector for reactant gas recirculation. 3,982,961, Cl. 429-34.000.

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Graves, Charles Berger; Richnak, Paul J.; Wilkinson, Robert M.; and Wright, Robert G., to Alton Box Board Company. Paperboard hogshead. 3,982,681, Cl. 229-4.500.

Gray, Charles H., to Dow Chemical Company, The. Method of injection molding structural foam having accurate mold surface reproductions. 3,983,196, Cl. 264-45.500.

Gray, Frederick W., to Colgate-Palmolive Company. Activated peroxy bleach composition. 3,982,892, Cl. 8-111.000.

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Gribsvad, Jorgen, to Haldor Topsoe A/S. Heat exchange apparatus. 3,982,585, Cl. 165-83.000.

Griffith, Ernest S.; and Davis, William W., to Sperry Rand Corporation. Full-duplex digital transmission line system. 3,983,323, Cl. 178-58.00R.

Grimble, Ralph E., to Westinghouse Electric Corporation. Drift eliminators for evaporative cooling towers. 3,982,914, Cl. 55-257.0QV.

Grinev, Alexei Nikolaevich; Stolyarchuk, Alexandr Alexandrovich; Galenko-Yaroshevsky, Pavel Alexandrovich; Tantsjura, Vladimir Spiridonovich; and Arkhangelskaya, Natalya Vitalievna. Derivatives of 5-hydroxy-6-diloweralkylaminomethyl-benzofurans. 3,983,141, Cl. 260-346.20R.

Grisar, Johann M.; Sill, Arthur D.; and Fleming, Robert W., to Richardson-Merrell Inc. Bis(aminoalkylsulfamoyl)anthraquinone antiviral agents. 3,983,248, Cl. 424-321.000.

Grobe, Wolfgang: *See—*
Hoger, Karl; and Grobe, Wolfgang, 3,982,885.

Grobey, Paul A. Power cultivator with reciprocating blade. 3,982,593, Cl. 172-40.000.

Groleau, Rodney J.; and Paulson, Donald C., to Control Process, Incorporated. Method of determining molded part profile. 3,982,440, Cl. 73-432.00R.

Gross, Rodney T.: *See—*
Venal, Wilfredo V.; Klein, H. Joseph; Daniel, Richard R.; and Gross, Rodney T., 3,982,925.

Grosseau, Albert, to Societe Anonyme Automobiles Citroen. Universal joint with assembly feature. 3,982,840, Cl. 403-14.000.

Grosso, Donald S.; and Asmundsson, Einar, to Teleco Inc. Control system for borehole sensor. 3,982,431, Cl. 73-151.000.

Grozier, John David: *See—*
Koros, Peter J.; and Grozier, John David, 3,982,969.

Gruebele, Dale W.: *See—*
Firehammer, John D.; and Gruebele, Dale W., 3,983,364.

Gruffaz, Max: *See—*
Balme, Maurice; and Gruffaz, Max, 3,983,100.

Grumman American Aviation Corporation: *See—*
Gordon, Walter R., 3,982,696.

Gruner, Hans, to Graubremse GmbH. Multi-circuit air-brake system, in particular for motor vehicles. 3,982,795, Cl. 303-52.000.

Grunwald, Thomas Ludwig: *See—*
Knorr, Eberhard; Grunwald, Thomas Ludwig; and Oswald, Arno, 3,982,582.

Gruppo Lepetit S.p.A.: *See—*
Oppici, Ernesto; and Gianantonio, Anacleto, 3,983,109.
Tarzia, Giorgio; and Panzone, Gianbattista, 3,983,127.

GTE Automatic Electric Laboratories Incorporated: *See—*
Ward, Ronald C.; and Kosten, Richard B., 3,982,809.
Wedmore, William R.; and Verbeek, Dennis H., 3,983,339.

GTE Laboratories Incorporated: *See—*
Gladstone, Jerry M., 3,983,493.

GTE Sylvania Incorporated: *See—*
Siranni, J. Donald; and Smith, Charles W., 3,983,371.

Guadagna, John P.: *See—*
Gunsagar, Kamleshwar C.; and Guadagna, John P., 3,983,413.
Stafford, Kenneth R.; and Guadagna, John P., 3,983,414.

Guagliardo, Matthew: *See—*
Stone, Edward; Zamer, Joseph; and Guagliardo, Matthew, 3,982,986.

Guaglione, Giovanni Paolo, to I-T-E Imperial Corporation. Two-pressure gas circuit breaker with low pressure gas heating. 3,983,346, Cl. 200-148.00R.

Guaglione, Giovanni Paolo; and Tschannen, Christian, to I-T-E Imperial Corporation. Gas-filled high current bushing with forced cooling arrangement. 3,983,353, Cl. 200-148.00R.

Guenette, Jean Guy, to Lawrence Peska Associates, Inc., a part interest. Garbage container unit. 3,982,407, Cl. 62-441.000.

Gugliotta, George, to Automation Systems, Inc. Apparatus for hardware item inspection. 3,983,388, Cl. 250-223.00R.

Gunn, Damon M. Article sorting apparatus and method. 3,983,366, Cl. 235-61.11R.

Gunsagar, Kamleshwar C.; and Guadagna, John P., to Fairchild Camera and Instrument Corporation. Balanced differential capacitively decoupled charge sensor. 3,983,413, Cl. 307-235.00F.

Gunzinger-Gunzinger, Henri: *See—*
Camin, Michel G., 3,983,350.

Gupta, Avinash: *See—*
Schoenrock, Karlheinz W. R.; Gupta, Avinash; and Rounds, Hugh G., 3,982,956.

Gustafson, David J.: *See—*
De Pauw, Richard A.; and Gustafson, David J., 3,982,549.

Gustafsson, Rune; Karlsson, Ingemar; and Akesson, Rolf, to Aktiebolaget Svenska Flaktfabriken. Dryer for material coated on two surfaces. 3,982,328, Cl. 34-156.000.

Gutman, David. Clamping device. 3,982,740, Cl. 269-110.000.

Gutman, Mark Borisovich; Kaufman, Vsevolod Grigorievich; Gorodinsky, Mikhail Savelievich; Shakhnes, Jury Alexandrovich; Mezhueva, Larisa Sergeevna; Altukhova, Irina Stepanovna; Kaloshin, Jury Grigorievich, deceased; and by Kaloshina, Albina Adolfovna, administratrix. Method of electrolytic borating of articles. 3,983,013, Cl. 204-39.000.

Guyot, Charles; and Muller, Jacques, to Ebauches Tavannes SA. Digital display mechanism for a time-keeper. 3,982,388, Cl. 58-85.500.

H. B. Fuller Company: *See—*
Juba, Bernard T.; and Collins, James A., 3,983,206.

H. Krantz, Firma: *See—*
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Haapala, Jalo P. Structural space element. 3,982,366, Cl. 52-220.000.

Habata, Kiichi; Tanaka, Shozo; and Araki, Hitoyuki, to Shinetsu Chemical Company. Process for preparing methyl chloride. 3,983,180, Cl. 260-657.000.

Haberland, Ulrich: *See—*
Nielinger, Werner; Dhein, Rolf; Haberland, Ulrich; Michael, Dietrich; and Hermann, Karl-Heinz, 3,983,306.

Haeussler, Ernst. Facade wall assembly. 3,982,372, Cl. 52-513.000.

Haffenden-Richborough Limited: *See—*
Marsh, William Francis, 3,982,450.

Hagiwara, Yoshitoshi: *See—*
Osawa, Makoto; Hagiwara, Yoshitoshi; Kawakita, Takao; Motoyoshi, Kenya; and Kuroishi, Nobuhito, 3,982,905.

Hahn, James R.; and Vallender, James A., to Dow Corning Corporation. Polyorganosiloxane pressure sensitive adhesives and articles therefrom. 3,983,298, Cl. 428-355.000.

Hahn & Kolb: *See—*
Scheiffele, Helmut, 3,982,452.

Halasz, Stephen J.: *See—*
Green, Harold; and Halasz, Stephen J., 3,982,836.

Haldimann, Hans Rudolf; Buehler, Max; and Brown, Patrick R., to Weelpal, A.G. Shelf storage system. 3,982,639, Cl. 214-16.40C.

Haldor Topsoe A/S: *See—*
Gribsvad, Jorgen, 3,982,585.

Halldin, Matts Arne Bernhard; and Andreasson, Nils Rune Gustaf, to Gnosjoplast AB. Breathing mask, particularly for artificial respiration. 3,982,532, Cl. 128-146.000.

Halliburton Company: *See—*
Harriman, Donald W., 3,982,590.

Hamm, Klaus; and Beck, Otto, to Fr. Hesser Maschinenfabrik AG. Device for welding and parting thermoplastic foils. 3,982,991, Cl. 156-515.000.

Hammond, William D. Well monitoring and analyzing system. 3,982,432, Cl. 73-151.500.

Hamrick, Joseph T.; and Rose, Leslie C., to World Energy Systems. Downhole recovery system. 3,982,591, Cl. 166-302.000.

Hamrick, Joseph T.; and Rose, Leslie C., to World Energy Systems. In situ hydrogenation of hydrocarbons in underground formations. 3,982,592, Cl. 166-302.000.

Hancock, James Lloyd, to General Motors Corporation. Low voltage aluminum commutators. 3,983,431, Cl. 310-233.000.

Hancock, Reginald Ronald; and Maw, Peter James Reuben, to Imperial Chemical Industries Limited. Apparatus and method for processing yarn. 3,982,708, Cl. 242-36.000.

Hanks, Jack G.: *See—*
Cotton, John F.; Hanks, Jack G.; and Wien, Raymond E., 3,983,454.

Hansen, George E.: *See—*
Van Brocklin, Lester; Hansen, George E.; and Kuck, Mark A., 3,983,225.

Hansen, Gordon J.: *See—*
Benson, Jay L.; and Hansen, Gordon J., 3,983,437.

Hansen, Knud Erik: *See—*
Soikie, Anthony Joseph; Jaskulski, Leon; and Hansen, Knud Erik, 3,982,300.

Hanslik, Tomas: *See—*
Casensky, Bohuslav; Machacek, Jiri; and Hanslik, Tomas, 3,983,150.

Hanson, Robert S.; and Benasutti, Louis D., to General Motors Corporation. Refrigerator water storage and dispensing system with water filter. 3,982,406, Cl. 62-339.000.

Hardtmann, Goetz E.; and Jackson, Thomas E., to Sandoz, Inc. 3-Alkylsulfinyl-2-indolinones and their pharmaceutical compositions and use. 3,983,242, Cl. 424-274.000.

Harnau, Hans D.: *See—*
Richelle, Adelin F.; and Harnau, Hans D., 3,982,487.

Harned, John L., to General Motors Corporation. Air mass flow measuring apparatus. 3,982,435, Cl. 73-194.00M.

Harnish, Wayne Nelson: *See—*
Gibbons, Loren Kenneth; Peake, Clinton Joseph; and Harnish, Wayne Nelson, 3,983,246.

Harriman, Donald W., to Halliburton Company. Well bore cleaning device. 3,982,590, Cl. 166-173.000.

Harris, Robert D.: *See—*
Saltsman, Robert D.; and Harris, Robert D., 3,982,330.

Harrison, Charles W.; Mead, Theodore C.; Moreland, Howard R.; and Barger, Frank L., to Texaco Inc. Means for measuring the wax content of waxy oil. 3,982,422, Cl. 73-53.000.

Harrison, Phillip L.: *See—*
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Harsco Corporation: *See—*
Burnham, Peter B., 3,982,295.

Hartel, Gunter, to Deutsche Vergaser GmbH & Co. Kommanditgesellschaft. Control installation for the proportioning of a secondary air quantity for achieving optimum combustion or after-burning in internal combustion engines. 3,982,394, Cl. 60-276.000.

Harthun, Norman Edward, to Telford Smith, Inc. Combination surge relief and back flow prevention valve. 3,982,561, Cl. 137-596.200.

Hartman, John T.: *See—*
Newman, Frederick S.; Hartman, John T.; and Dedona, Francis A., 3,983,014.

Hartman, Wayne J.: *See—*
Van Brussel, William R.; Lestage, Joseph C.; and Hartman, Wayne J., 3,982,673.

Hartung, Herbert; Durckheimer, Walter; Schrinner, Elmar; and Gerhards, Hermann, to Hoechst Aktiengesellschaft. 2-Carboxamido-substituted tetracyclines and process for their manufacture. 3,983,173, Cl. 260-559.0AT.

Haruta, Masahiro: *See—*
Nakazawa, Mitsunobu; Araki, Yoshiaki; Haruta, Masahiro; and Satomi, Kunio, 3,983,564.

Hasbro Industries, Inc.: *See—*
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Haschke, Heinz: *See—*
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Hasegawa, Kohichi; and Konomi, Toshiaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust system for multi-cylinder internal combustion. 3,982,395, Cl. 60-278.000.

Hasegawa, Tetsuo: *See—*
Kinjo, Kikuo; Matsuno, Hiroshi; Hasegawa, Tetsuo; and Kato, Hideo, 3,982,940.

Hashimoto, Kimio. Tooth pick holder. 3,982,660, Cl. 221-190.000.

Hashimoto, Sho; Nakada, Akira; Kano, Saburo; and Takahashi, Susumu, to Nippon Soda Company Limited. Imidazole derivatives. 3,983,241, Cl. 424-273.000.

Hashizume, Hikaru: *See—*
Obayashi, Nobuharu; Hashizume, Hikaru; Sakashita, Noriji; Kameyama, Seiji; Ezawa, Sadaaki; Kugisawa, Toshio; Washiyama, Yutaka; Kondo, Tatsunori; and Watanabe, Hironori, 3,982,460.

Haskell, Theodore Herbert: *See—*
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Hatanaka, Toru: *See—*
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Hattori, Katsuji; Fukai, Masakazu; Moriyama, Akio; and Nishizawa, Yasuhiro, to Matsushita Electric Industrial Co., Ltd. Liquid crystal display device. 3,982,820, Cl. 350-160.0LC.

Hatzmann, John F.: *See—*
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Haugwitz, Rudiger D.: *See—*
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Hauser, Raimund: *See—*
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Hawker Siddeley Dynamics Limited: *See—*
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Hawkins, Edwin George Edward, to BP Chemicals International Limited. Peroxy compounds and processes for their preparation. 3,983,142, Cl. 260-348.00C.

Hawkins, Jerry M.: *See—*
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Hayashi, Izuo; and Nannichi, Yasuo, to Nippon Electric Company, Ltd. Semiconductor double heterostructure laser device and method of making the same. 3,983,510, Cl. 331-94.50H.

Hayes, John C.: *See—*
Mitsche, Roy T.; Kuntz, Hillard L.; and Hayes, John C., 3,983,197.

Hayes, Royce. Traffic control signal apparatus. 3,983,532, Cl. 340-41.00R.

Healey, Daniel P., Jr., to Chase-Shawmut Company, The. Electric fuse and tube material adapted for use as fuse casing. 3,983,525, Cl. 337-186.000.

Health Technology Labs, Inc.: *See—*
Muriot, Edward E., 3,982,539.

Heck, Willis A.; and Ferre, Roy E., to ESM, Inc. Composition for a fluidizing flux in the production of iron and steel. 3,982,929, Cl. 75-94.000.

Heckathorn, Donald W. Fishing line weight. 3,982,350, Cl. 43-43.100.

Heckler & Koch GmbH: *See—*
Brandl, Rudolf; Moller, Tilo; Saile, Karl; and Streckfuss, Heinrich, 3,982,347.

Hegeler, Wilhelm, to Blaupunkt-Werke GmbH. Phase locked loop. 3,983,497, Cl. 328-155.000.

Hehl, Karl. Base and power unit for injection molding machine. 3,982,856, Cl. 417-360.000.

Heidorn, John H.; and Bernard, James A., to General Motors Corporation. Power-operating vertically adjustable cantilever shelves for appliance cabinets. 3,982,801, Cl. 312-306.000.

Heimberger, Helmut, to Opti-Holding AG. Apparatus for making slide-fastener stringers. 3,982,988, Cl. 156-380.000.

Heins, Sidney M. Method for dry removal of sulfur dioxide from furnace flue, coal and other gases. 3,983,218, Cl. 423-244.000.

Helmuth, Gene R.: *See—*
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Hengen, Edward John: *See—*
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Henis, Jay M., to Monsanto Company. Nitrogen oxide decomposition process. 3,983,021, Cl. 204-164.000.

Hennenberg, Wilhelm Friedrich: *See—*
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Hennenfent, Douglas Joseph; and Holmstrand, Allan Lawrence, to Control Data Corporation. Magnetic transducer head core manufacturing method. 3,982,318, Cl. 29-603.000.

Hentz, Lyle J.; and Otto, Willard G., to Western Electric Company, Inc. Methods for mounting an article on an adherent site on a substrate. 3,982,979, Cl. 156-73.600.

Hentzschel, Hanspeter P. K.: *See—*
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Herbst, Noel M.; and Morrissey, John H., to International Business Machines Corporation. Signature verification method and apparatus. 3,983,535, Cl. 340-146.3SY.

Hercules Incorporated: *See—*
Carpenter, Charles W., 3,982,978.
Elrick, Donald E.; and Gilbert, Harry, 3,982,975.

Herman, John A. Hot air furnace. 3,982,525, Cl. 126-99.00R.

Hermann, Karl-Heinz: *See—*
Nielinger, Werner; Dhein, Rolf; Haberland, Ulrich; Michael, Dietrich; and Hermann, Karl-Heinz, 3,983,306.

Herro, Richard E. Athletic shoe with a detachable sole. 3,982,336, Cl. 36-62.000.

Herscovici, Saul; and Anderson, Lawrence Vernon, to Deere & Company. Tractor having transmission-driven power take-off. 3,982,599, Cl. 180-53.00R.

Hersey, Carl; and Resop, W. Paul. Sit-n-cycle. 3,982,756, Cl. 272-126.000.

Hertel, Heinz E., to Bell & Howell Company. Film core with restrainer. 3,982,709, Cl. 242-74.000.

Herzer, William P.; and Cullen, Robert E., to Union Special Corporation. Automatic sewing machine. 3,982,491, Cl. 112-121.120.

Herzner, Frederick C.: *See—*
Andersen, Richard H.; Dins, Carl R.; and Herzner, Frederick C., 3,982,852.

Hess, Howard V.; and Franz, William F., to Texaco Inc. Brine desalination process with phase-breaking by cold hydrocarbon injection. 3,983,032, Cl. 210-22.00R.

Hesse, Dieter: *See—*
Rauch, Konrad; Kiefer, Hans; Hesse, Dieter; Strohmeyer, Max; and Hohenschutz, Heinz, 3,983,010.

Heston, Eugene E. Self-purging screen changer and strainer plate. 3,983,038, Cl. 210-447.000.

Hi-Shear Corporation: *See—*
Sekhon, Jagdish S., 3,983,304.
Hicken, Emerald W. Retriever. 3,982,294, Cl. 9-9.000.
Hickey, Christopher Daniel Dowling, to Airflex Containers Limited. Clamps for joining tubes or tubular structural members. 3,982,779, Cl. 285-328.000.
Hicks, Alton D.: *See—*
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Higuchi, Toru: *See—*
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Hill, Alfred, to Glacier Metal Company Limited, The. Thrust bearings. 3,982,796, Cl. 308-122.000.
Hill, Gerald L. Bicycle powered boat. 3,982,495, Cl. 115-27.000.
Hilleman, Maurice R.: *See—*
Woodhour, Allen F.; and Hilleman, Maurice R., 3,983,228.
Hills, William H. Fishing lure. 3,982,349, Cl. 43-42.480.
Hindersinn, Raymond R.: *See—*
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Hinman, Walter L., Jr., to Westinghouse Electric Corporation. Direct transfer-trip relaying system. 3,983,455, Cl. 317-27.00R.
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Hirai, Masataka; Takahashi, Toshio; Arita, Kishio; Yamauchi, Goro; and Kubo, Shugo, to Nippon Telegraph and Telephone Public Corporation. Production of aluminum-aluminum oxide dispersion composite conductive material and product thereof. 3,982,906, Cl. 29-182.500.
Hirano, Masachika: *See—*
Satomi, Takeo; Mukai, Kunio; Mine, Akihiko; Hino, Naganori; Tateishi, Kohshi; and Hirano, Masachika, 3,982,921.
Hirata, Chuji; Yokogawa, Yasunori; and Tabira, Tsutomu, to Ajinomoto Co., Inc. Process for preparing NaOH.3.5 H_2O crystals. 3,983,215, Cl. 423-198.000.
Hirooka, Masaaki; and Takeo, Shigeru, to Hodogaya Chemical Co., Ltd. Process for preparing polyurethane emulsions. 3,983,058, Cl. 260-29.2TN.
Hirth, Heimo, to Hoechst Aktiengesellschaft. Exposure means for photocopying apparatus. 3,982,829, Cl. 355-1.000.
Hitachi, Ltd.: *See—*
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Hitachi Metals, Ltd.: *See—*
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Hitzman, Donald O.; and Wegner, Eugene H., to Phillips Petroleum Company. Methanol foam fermentation to single cell protein by microorganisms. 3,982,998, Cl. 195-49.000.
Hobart Corporation: *See—*
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Hodama, Takuo, to Nihon Dengyo Co., Ltd. Multichannel signal transmitting and receiving apparatus. 3,983,484, Cl. 325-20.000.
Hodne, Ingard B.: *See—*
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Hoekje, Howard H.; and Dietz, Paul L., to PPG Industries, Inc. Secondary electrochemical cell having non-consumable silicon cathode. 3,982,960, Cl. 429-199.000.
Hoffman, Theodore S.: *See—*
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Hoger, Karl; and Grobe, Wolfgang, to International Standard Electric Corporation. Method and arrangement for inhomogeneous annealing of small parts. 3,982,885, Cl. 432-24.000.
Hohenschutz, Heinz: *See—*
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Holland, Gerald F., to Pfizer Inc. Hypolipidemic alkenesulfonamides. 3,983,107, Cl. 260-240.00J.
Holland-Letz, Guenter, to Nixdorf Computer AG. Device for locking a movable form feed. 3,982,677, Cl. 226-75.000.
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Hollyday, William C., Jr., to Exxon Research and Engineering Company. Nitrogen-containing cold flow improvers for middle distillates. 3,982,909, Cl. 44-66.000.
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Holtrop, John W. Stratified charge internal combustion engine. 3,982,506, Cl. 123-75.00B.
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Honjo, Satoru; Miyatuka, Hajime; and Matsumoto, Seiji, to Fuji Photo Film Co., Ltd. Photoconductive toners which include photoconductive pigment particles in a charge-transporting insulating binder. 3,982,938, Cl. 96-1.500.
Honma, Uichi, to Nippon Piston Ring Co., Ltd. Heat and wear resistant sintered alloy. 3,982,907, Cl. 29-182.700.
Honore, Etienne A. H.; and Torcheux, Emile L. G., to Societe d'Etude et d'Application des Techniques Nouvelles NEO-TEC. Novel structure for radio position fixing using hyperbolic phase measurement. 3,983,559, Cl. 343-105.00R.
Honshima, Masakatsu: *See—*
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Hoogesteger, Paul A.; and Kadlecik, John, to Bausch & Lomb Incorporated. Manual switching means for contact lens disinfecting apparatus. 3,983,362, Cl. 219-521.000.
Hooker Chemicals & Plastics Corporation: *See—*
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Horsch, Joachim, to International Harvester Company. Brake provided with gravity-feed automatic supplementary-cooling control. 3,982,618, Cl. 192-113.00B.
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Horvath, Louis W., to Spaceair Products, Inc. Prefabricated support and floor system for building. 3,982,364, Cl. 52-126.000.
Hosoda, Minoru; Kasiwagi, Eiichi; Murayama, Fumio; and Isayama, Kohei, to Dai Nippon Toryo Co., Ltd. Aqueous epoxy resin paint composition. 3,983,056, Cl. 260-29.2EP.
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Hottenroth, Fred W.; and Hottenroth, Fred W., III. Portable forced draft cooker. 3,982,522, Cl. 126-2.000.
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Houseman, John; and Cerini, Donald J., to United States of America, National Aeronautics and Space Administration. Hydrogen-rich gas generator. 3,982,910, Cl. 48-61.000.
Howard, Gerald T. Electric generator. 3,983,430, Cl. 310-155.000.
Howatt, George F., to New England Envelope Manufacturing Co. Envelope machine with window patch removal mechanism. 3,982,472, Cl. 93-61.00A.
Howes, Charles L., Jr. Dual-use tennis court parking lot construction methods and apparatus. 3,982,758, Cl. 273-29.00R.
Huang, Keng Tang: *See—*
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Hubbard, Winchester Loomis: *See—*
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Huber, Peter; Pirson, Ewald; and Lampelzammer, Helga, to Wacker-Chemie GmbH. Method for improving the lubricating properties and imparting antistatic properties to organic fibers. 3,983,272, Cl. 427-407.00R.
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Smith, Sidney R., 3,983,457.
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Hyman, Myles, to Sperry Rand Corporation. Stalk rolls for corn harvesters. 3,982,385, Cl. 56-106.000.
Hyodo, Masayoshi, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Switching apparatus. 3,983,355, Cl. 200-264.000.
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Ichikawa, Yataro; and Yamaji, Teizo, to Teijin Limited. Process for producing biphenylpolycarboxylic acid ester. 3,983,159, Cl. 260-473.00R.
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Inskip, Harold Kirkwood, to Du Pont de Nemours, E. I., and Company. Photopolymerizable paste compositions and their use. 3,982,941, Cl. 96-34.000.
Instore Advertising, Inc.: *See—*
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Interlego A.G.: *See—*
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Irwin Toy Limited: *See—*
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Ishihara, Yasuo, to Nippon Electric Company, Ltd. Charge-coupled linear image sensing device. 3,983,573, Cl. 357-24.000.

Ishijima, Yoichi: *See—*
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Ishikawa, Kanichi; and Iijima, Kazumi, to Nippondenso Co., Ltd. Soldering method. 3,982,680, Cl. 228-174.000.
Isoard, Bernard; and Juppet, Paul, to Rhone-Poulenc-Textile. Yarn handling pneumatic device. 3,982,412, Cl. 68-200.000.
Isohata, Junji, to Canon Kabushiki Kaisha. Automatic wafer orienting apparatus. 3,982,627, Cl. 214-1.00Q.
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Ito, Youichi; and Kitamura, Kozo, to Sharp Kabushiki Kaisha. Introduction of data entry completion signals to a cassette tape containing data processing terminal unit. 3,983,577, Cl. 360-4.000.
Itoh, Katsumi; and Mori, Kazumasa, to Nippondenso Co., Ltd. Voltage regulating system. 3,983,471, Cl. 322-28.000.
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Ivashuk, Michael; and McDaniel, Marvin Lee. Vehicle crash bag. 3,982,774, Cl. 280-737.000.
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Johnston, Daniel U.; and Larson, Robert L., to General Motors Corporation. Vacuum reducer valve assembly. 3,982,553, Cl. 137-81.000.
Jones, Francis Lyle, to Towmotor Corporation. Field shunting control for a DC series motor. 3,983,462, Cl. 318-139.000.
Jones, Gardner D., Jr., to International Business Machines Corporation. Digital automatic gain control circuit. 3,983,381, Cl. 235-154.000.
Jones, Ivor Wynn; Robinson, Graham; and Bird, Thomas Lewis, to Electricity Council, The. Sodium sulphur cells. 3,982,957, Cl. 429-163.000.
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Jones, Michael Edward Benet, to Imperial Chemical Industries Limited. Article comprising an adherend with a thermoplastic polymer including $-ArSO_2-$ repeating units adhering thereto. 3,983,300, Cl. 428-411.000.
Jones, Walter C., to Rubber Dynamics Corporation. Elastic storage tank and method for making the same. 3,982,573, Cl. 150-.500.
Jonsson, Olov; and Milaszewski, Edward. Edge reinforcement for sandwich-type building panel. 3,982,367, Cl. 52-309.000.
Jordan, Lester J.; and Platko, Steve, to Corning Glass Works. Electrical device assembly and method. 3,983,458, Cl. 317-101.0CP.
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Judin, Nikolai Fedorovich: *See—*
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Jurisch, Louis A., to IMC Chemical Group, Inc. Process of preparing sand cores by using oxazoline condensates. 3,983,071, Cl. 260-42.000.
Just, George E.; and Simonovitch, Chaim, to Just, George E. Intermediates for producing prostaglandins. 3,983,136, Cl. 260-326.800.
Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft: *See—*
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Kageyama, Yuriaki: *See—*
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Kaiserswerth, Hans-Peter; Wimmer, Josef; and Schaller, Rudolf, to Siemens Aktiengesellschaft. Dampened choke coil. 3,982,814, Cl. 323-78.000.
Kajaani Oy, Elektroniika: *See—*
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Kaloshin, Jury Grigorievich, deceased: *See—*
Gutman, Mark Borisovich; Kaufman, Vsevolod Grigorievich; Gorodinsky, Mikhail Savelievich; Shakhnes, Jury Alexandrovich; Mezhueva, Larisa Sergeevna; Altukhova, Irina Stepanovna; Kaloshin, Jury Grigorievich, deceased; and Kaloshina, Albina Adolfovna, administratrix, 3,983,013.
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Kameyama, Seiji: *See—*
Obayashi, Nobuharu; Hashizume, Hikaru; Sakashita, Noriji; Kameyama, Seiji; Ezawa, Sadaaki; Kugisawa, Toshio; Washiyama, Yutaka; Kondo, Tatsunori; and Watanabe, Hironori, 3,982,460.
Kampf, Wolfgang, to Chemische Werke Huls Aktiengesellschaft. Production of high-vinyl group, low-molecular weight unsaturated hydrocarbon polymers. 3,983,183, Cl. 260-680.00B.
Kamphuis, Gerrit George, to Stork Amsterdam B.V. Column for draining a whey-curd mixture. 3,982,480, Cl. 99-456.000.
Kamyr, Inc.: *See—*
Funk, Erwin D., 3,982,789.
Kano, Saburo: *See—*
Hashimoto, Sho; Nakada, Akira; Kano, Saburo; and Takahashi, Susumu, 3,983,241.
Kanojia, Ramesh Maganlal, to Ortho Pharmaceutical Corporation. 17β-Ethynyl-3,17α-estradiol and derivatives thereof. 3,983,112, Cl. 260-239.55R.
Karasawa, Tadahiko: *See—*
Nagai, Yasutaka; Uno, Hitoshi; Shimizu, Masanao; and Karasawa, Tadahiko, 3,983,239.
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Karlen, Urs, to BBC Brown Boveri & Company Limited. Scanning device for TIG-spot welding of commutator segment lugs to taps on rotor winding. 3,983,358, Cl. 219-124.000.
Karlsson, Ingemar: *See—*
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Kasiwagi, Eiichi: *See—*
Hosoda, Minoru; Kasiwagi, Eiichi; Murayama, Fumio; and Isayama, Kohei, 3,983,056.
Kasper, Cass S., to Inter-Lakes Engineering Co. Machine and process for assembling cathodes. 3,982,321, Cl. 29-624.000.
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Kato, Hideo: *See—*
Kinjo, Kikuo; Matsuno, Hiroshi; Hasegawa, Tetsuo; and Kato, Hideo, 3,982,940.
Katsuoka, Ritsu; and Kawai, Hisasi, to Nippon Soken, Inc. Digital hyperbolic function generator. 3,983,369, Cl. 235-150.530.
Katzbeck, John W., Jr.: *See—*
Wilson, Walter M.; and Katzbeck, John W., Jr., 3,982,806.
Kauffman, Ivan L.; and Kellogg, Robert C., to Ex-Cell-O Corporation. Lateral transfer loading apparatus for stretch blow machines. 3,982,872, Cl. 425-397.000.
Kaufman, Carl L.: *See—*
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Kaufman, Vsevolod Grigorievich: *See—*
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Kaupert, Gunther. Nestable compartmentalized trays. 3,982,655, Cl. 220-23.600.
Kawai, Hisasi: *See—*
Katsuoka, Ritsu; and Kawai, Hisasi, 3,983,369.
Kawakita, Takao: *See—*
Osawa, Makoto; Hagiwara, Yoshitoshi; Kawakita, Takao; Motoyoshi, Kenya; and Kuroishi, Nobuhito, 3,982,905.
Kawase, Yozo; and Mitsuhashi, Yoshiyasu, to Tokyo Shibaura Denki Kabushiki Kaisha (also known as Tokyo Shibaura Elec. Co., Ltd.). Apparatus for locking guide vanes of water wheel turbines or pumps. 3,982,847, Cl. 415-9.000.
Kee Woo, Peter Wing; and Haskell, Theodore Herbert, to Parke, Davis & Company. Process for preparing 5''-amino-4',5''-dideoxybutirosin A. 3,983,102, Cl. 536-17.000.
Keisling, Charles A.; and Sand, Leonard B., to Zeochem Corporation. Test method for determining zeolite. 3,982,896, Cl. 23-230.00R.
Keith, Roger H., to Minnesota Mining and Manufacturing Company. Conformable plastic body side molding. 3,982,780, Cl. 293-1.000.
Keleske, Henry P. Insulated building block. 3,982,369, Cl. 52-407.000.
Keller, Harry; and Forrester, Edward H., to Honeywell Inc. Rapid bus priority resolution. 3,983,540, Cl. 340-172.500.
Keller, Jerome Edmund; Moore, Ronald Lynn; and Cook, Harold, Jr., to Coors Container Company. One piece container end member with an integral hinged opening tab portion. 3,982,657, Cl. 220-268.000.
Keller, Rudolf: *See—*
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Kellogg, Robert C.: *See—*
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Kellogg, Walter J., to Westinghouse Electric Corporation. Switch operator. 3,983,348, Cl. 200-314.000.
Kelly, Helen Janet: *See—*
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Kelm, Everett F., to Corning Glass Works. Fluid handling apparatus. 3,982,899, Cl. 23-259.000.
Kemira Oy: *See—*
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Kendall Company, The: *See—*
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Kendziora, Heinz; Nenner, Johannes; Schoer, Heinz; and Schultze, Werner, to Vereinigte Aluminium-Werke Aktiengesellschaft. Flux-free soldering of aluminum-containing workpieces in a controlled atmosphere. 3,982,887, Cl. 432-128.000.
Kennecott Copper Corporation: *See—*
Marshall, David W.; and Agarwal, Jagdish Chandra, 3,983,075.
Szabo, Lester J., 3,983,017.
Kenney, Joseph F., to Remington Arms Company, Inc. Ammunition priming mixtures and method of forming same. 3,983,149, Cl. 260-435.00A.
Keranen, Theodore W., to Bendix Corporation, The. Air density computer for an internal combustion engine fuel control system. 3,982,503, Cl. 123-32.0EA.
Kerotest Manufacturing Corporation: *See—*
Tricini, John D., 3,982,729.
Kesling, Keith K., to General Motors Corporation. Appliance remote touch-control panel with sound system. 3,983,553, Cl. 340-365.00R.
Ketcham, David J.; Lowe, Roger W.; Pruznick, Michael D.; and Opitek, Eugene W., to Hughes Aircraft Company. Raster display histogram equalization. 3,983,320, Cl. 178-6.800.
Key, William D.: *See—*
Robbins, Elmer A.; and Key, William D., 3,982,664.
Keystone International, Inc.: *See—*
Clark, Malcolm D., 3,982,725.
Keyworth, Donald A.: *See—*
Sudduth, Jerome R.; and Keyworth, Donald A., 3,983,216.
Kharasch, Jerome A. Complexing cresolase with copper chelating agents. 3,982,999, Cl. 195-63.000.
Khina, Mikhail Lvovich: *See—*
Pozdneev, Viktor Timofeevich; Khina, Mikhail Lvovich; Bashkirov, Dmitry Vasilievich; Judin, Nikolai Fedorovich; and Kobzev, Nikolai Sergeevich, 3,983,088.
Kiefer, Hans: *See—*
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Kienzler Apparate GmbH: *See—*
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Kikkawa, Nobuyuki: *See—*
Shinozaki, Tatsuo; Kikkawa, Nobuyuki; Fujitani, Fumiaki; and Tanaka, Kenjiro, 3,983,008.

Kikuchi, Hideaki: *See—*
Yamanaka, Yoshio; Watanabe, Kazuyoshi; Honshima, Masakatsu; and Kikuchi, Hideaki, 3,982,971.

Kikuchi, Tadao, to Hitachi, Ltd. Signal generator circuit. 3,983,420, Cl. 307-279.000.

Kikuzawa, Kenji; Sasaguri, Kilchiro; Oda, Yasuyoshi; Sano, Hiroshi; and Okina, Katsumi, to Asahi Kasei Kogyo Kabushiki Kaisha. Unsaturated polyester resin composition. 3,983,184, Cl. 260-837.00R.

Kilborne, George B. Picture hanger. 3,982,719, Cl. 248-489.000.

Killop, James Thomas, to Anderson-Cook, Inc. Forming method and machine for splining power transmission members. 3,982,415, Cl. 72-88.000.

Kilmer, Charles L. Method and means of utilizing magnetism to achieve rotation of a drive shaft. 3,983,426, Cl. 310-46.000.

Kim, James C., to General Electric Company. MIS structures for background rejection in infrared imaging devices. 3,983,395, Cl. 250-370.000.

Kim, Jury Efimovich: *See—*
Krylov, Nikolai Ivanovich; Popov, Boris Vasilievich; Sidorov, Pavel Ivanovich; and Kim, Jury Efimovich, 3,982,456.

Kimberly-Clark Corporation: *See—*
Auer, Mary L.; and Roeder, Richard L., 3,982,687.
Sigl, Wayne C.; and Lassen, Frederick O., 3,982,325.

Kindig, Guilford E.; and Dierks, James E., to Eastman Kodak Company. Pressure roller assembly for self processing camera. 3,983,567, Cl. 354-86.000.

King, William Clyde, to Oy Paramic AB. Resistor network with adjustable resistance value. 3,983,528, Cl. 338-195.000.

Kingsley, William, to Xerox Corporation. Electrostatographic reproduction apparatus and drive therefor. 3,982,831, Cl. 355-5.000.

Kinjo, Kikuo; Matsuno, Hiroshi; Hasegawa, Tetsuo; and Kato, Hideo, to Canon Kabushiki Kaisha. Process for the formation of images. 3,982,940, Cl. 96-27.00R.

Kinki Printing Company Limited: *See—*
Shimada, Yoshiji, 3,982,685.

Kinney, Thomas D.: *See—*
Pickett, John E. P.; Kinney, Thomas D.; and Winders, Gene M., 3,982,862.

Kirk, Bradley S., to Airco, Inc. Methods and apparatus for controlling the supply of a feed gas to dissolution devices. 3,983,031, Cl. 210-15.000.

Kitahara, Takeshi: *See—*
Matsui, Masanao; Mori, Kenji; Kitahara, Takeshi; Kitamura, Seiichi; and Ohba, Kazumasa, 3,983,134.

Kitakami, Hisashi: *See—*
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Kitamura, Seiichi: *See—*
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Kitano, Noritoshi: *See—*
Morisawa, Yasuhiro; Kataoka, Mitsuru; Watanabe, Taiichiro; Kitano, Noritoshi; and Matsuzawa, Toshiaki, 3,983,238.

Klauke, Erich: *See—*
Buttner, Gerhard; Klauke, Erich; and Sasse, Klaus, 3,983,172.

Klaver, Rudolf F., to Chevron Research Company. Apparatus and method for a digital readout of distance traveled, fuel consumed and miles per gallon of a moving motor vehicle. 3,983,372, Cl. 235-150.210.

Kleimola, David L.; Nystuen, Marcus I.; and Nystuen, David L., to Economics Laboratory, Inc. Fine timing apparatus for electronic detergent dispensing system. 3,982,666, Cl. 222-70.000.

Klein, H. Joseph: *See—*
Venal, Wilfredo V.; Klein, H. Joseph; Daniel, Richard R.; and Gross, Rodney T., 3,982,925.

Klingler, Adolf: *See—*
Burgin, Gerard; and Klingler, Adolf, 3,982,786.

Klingler, Josef F. Simulated article display structure. 3,982,343, Cl. 40-27.500.

Klockner-Werke AG: *See—*
Geck, Gunther; and Langhammer, Hans Jurgen, 3,982,926.

Klund, Robert N., to Delkor Industries, Inc. Case erecting and forming machine. 3,982,474, Cl. 93-53.0SD.

Knight, Arthur H.: *See—*
Daniels, Raymond A.; and Knight, Arthur H., 3,982,830.

Knipp, Ulrich: *See—*
Boden, Heinrich; and Knipp, Ulrich, 3,982,870.

Knorr, Eberhard; Grunwald, Thomas Ludwig; and Oswald, Arno, to Concast AG. Method and apparatus for casting metals into a continuous casting mold. 3,982,582, Cl. 164-136.000.

Knott, Roger L.; Taunton-Rigby, Alison; and Mead, John A. R., to United States of America, Health, Education and Welfare. Production of N^3-methyltetrahydrohomofolic acid and related reduced derivatives of homofolic acid. 3,983,118, Cl. 260-251.500.

Kobe, Inc.: *See—*
Wilson, Phillip M.; Erickson, John W.; Nelson, Charles C.; and Budrys, Vitolis, 3,982,589.

Kobrehel, Gabrijela; Tamburasev, Zrinka; and Djokic, Slobodan, to PLIVA Pharmaceutical and Chemical Works. N-(Benzenesulfonyl)-erythromycylamine derivatives. 3,983,103, Cl. 536-9.000.

Kobzev, Nikolai Sergeevich: *See—*
Pozdneev, Viktor Timofeevich; Khina, Mikhail Lvovich; Bashkirov, Dmitry Vasilievich; Judin, Nikolai Fedorovich; and Kobzev, Nikolai Sergeevich, 3,983,088.

Koch, Robert E., to General Electric Company. Electrical current limiting fuse having fusible element with additional cross-sectional necks at an arcing clip. 3,983,524, Cl. 337-159.000.

Koch, Robert E., to General Electric Company. Current limiting fuse with auxiliary element arcing clip spaced by nonporous dielectric member. 3,983,526, Cl. 337-278.000.

Koenig, Harold R.: *See—*
Auyang, Raymond P.; and Koenig, Harold R., 3,983,022.

Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
Watanabe, Teruji; Suzuki, Shizuo; Yamamura, Kazuomi; and Iwamoto, Yoshinao, 3,983,475.

Kolibas, James A., to Addressograph Multigraph Corporation. Compressed optical system. 3,982,833, Cl. 355-11.000.

Koller, Ernst. Device for recording speed operating conditions of a wheeled vehicle. 3,983,565, Cl. 346-18.000.

Kompan, Louis, to Burns Foods Limited. Meat cutter. 3,982,299, Cl. 17-1.00R.

Kondo, Takashi; Fukunaga, Motoaki; and Kitakami, Hisashi, to Glory Kogyo Kabushiki Kaisha. Sheet counting machine. 3,983,367, Cl. 235-92.0SB.

Kondo, Tatsunori: *See—*
Obayashi, Nobuharu; Hashizume, Hikaru; Sakashita, Noriji; Kameyama, Seiji; Ezawa, Sadaaki; Kugisawa, Toshio; Washiyama, Yutaka; Kondo, Tatsunori; and Watanabe, Hironori, 3,982,460.

Kong, Ch'ng Seow. Reducing water consumption in water closets. 3,982,282, Cl. 4-1.000.

Konig, Hans-Bodo; Schrock, Wilfried; and Metzger, Karl Georg, to Bayer Aktiengesellschaft. Penicillins. 3,983,105, Cl. 260-239.100.

Konishiroku Photo Co. Ltd.: *See—*
Sato, Haruhiko; Ishikawa, Hidehiko; and Mogaki, Katsuo, 3,982,948.

Konomi, Toshiaki: *See—*
Hasegawa, Kohichi; and Konomi, Toshiaki, 3,982,395.

Konopasek, Francis. Defibrillator testing device. 3,983,476, Cl. 324-111.000.

Kopacki, Adam F.: *See—*
Eilers, Kenneth L.; and Kopacki, Adam F., 3,983,186.

Koppers Company, Inc.: *See—*
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Koros, Peter J.; and Grozier, John David, to Jones & Laughlin Steel Corporation. Low silicon high strength low alloy steel. 3,982,969, Cl. 148-12.00F.

Korosi, Matyas, to Eastman Kodak Company. Recovery of silver from gelatinous photographic wastes. 3,982,932, Cl. 75-118.00P.

Kortendick, Russell D. Manual log splitter. 3,982,572, Cl. 144-193.00D.

Kortenhaus, Dieter, to NSM Apparatebau GmbH Kommanditgesellschaft. Coin computing apparatus. 3,982,620, Cl. 194-1.00N.

Kosiarski, Joseph P.: *See—*
Buchoff, Leonard S.; Kosiarski, Joseph P.; and Dalamangas, Chris A., 3,982,320.

Kosicki, Witold W.: *See—*
Hollingsworth, Charles M.; and Kosicki, Witold W., 3,982,354.

Kosten, Richard B.: *See—*
Ward, Ronald C.; and Kosten, Richard B., 3,982,809.

Kostin, Vladimir Nikolaevich: *See—*
Nasyrov, Gakif Zakirovich; Kaluzhsky, Nikolai Andreevich; and Kostin, Vladimir Nikolaevich, 3,983,211.

Kowal, Leonard J.; and Gibson, Robert C., to Imperial-Eastman Corporation. Clamp-on valve structure. 3,982,563, Cl. 137-798.000.

Kozo Yoshizaki: *See—*
Ariga, Keiji; Nemoto, Tadashi; and Yasunaka, Kenji, 3,982,314.

Kramer, Wolfgang: *See—*
Buchel, Karl Heinz; Plempel, Manfred; and Kramer, Wolfgang, 3,983,240.

Kranik, John Robert: *See—*
Arndt, Herbert Lorenz, Jr.; Balderes, Demetrios; Kranik, John Robert; and Lucas, Charles John, 3,983,402.

Krapcho, John; and Turk, Chester F., to E. R. Squibb & Sons, Inc. 5-Heterocyclicalkyl-2-aryl-3-halo 1,5-benzothiazepin-4(5H)-ones. 3,983,106, Cl. 260-239.30B.

Krause Milling Company: *See—*
Alexander, Richard J.; and Krueger, Robert K., 3,983,084.

Kraynak, Joseph Stephen; and Blumenfield, Arthur, to Me-Books Publishing Company. Personalized computer printed hard covered book. 3,982,744, Cl. 270-12.000.

Kreiner, James E., Jr.: *See—*
Blanchard, William C.; and Kreiner, James E., Jr., 3,983,562.

Kreitz, Hans, to H. Krantz, Firma. Wet treatment device for dyeing textile material in the form of an endless rope. 3,982,411, Cl. 68-177.000.

Krenzer, John; and Richter, Sidney B., to Velsicol Chemical Corporation. Herbicidal compositions containing furancarboxamides. 3,982,922, Cl. 71-88.000.

Krenzer, John: *See—*
Richter, Sidney B.; and Krenzer, John, 3,983,174.

Krivakova, Miroslava: *See—*
Coupek, Jiri; Trukova, Jaroslava; Hubalkova, Olga; Krivakova, Miroslava; and Mansfeld, Viktor, 3,983,001.

Krizan, Bradford J.; and Pfaffendorf, James L., to Liberty Carton Co. Mail box container. 3,982,690, Cl. 232-17.000.

Krogseng, Gerald P.; and Paul, Fred R., Jr., to Minnesota Mining and Manufacturing Company. Ballistic inoculation of animals and projectile therefor. 3,982,536, Cl. 128-260.000.

Krueger, Robert K.: *See—*
Alexander, Richard J.; and Krueger, Robert K., 3,983,084.

Krupka, Morris. Brake lining device. 3,982,612, Cl. 188-73.100.

Krylov, Nikolai Ivanovich; Popov, Boris Vasilievich; Sidorov, Pavel Ivanovich; and Kim, Jury Efimovich. Circular saw for cutting rolled products. 3,982,456, Cl. 83-490.000.

Ku, San-Mei; Pillus, Charles A.; Poponiak, Michael R.; and Schwenker, Robert O., to International Business Machines Corporation. Method of proton-enhanced diffusion for simultaneously forming integrated circuit regions of varying depths. 3,982,967, Cl. 148-1.500.

Kubo, Shugo: *See—*
Hirai, Masataka; Takahashi, Toshio; Arita, Kishio; Yamauchi, Goro; and Kubo, Shugo, 3,982,906.

Kubo, Shuji, to Matsushita Electric Industrial Co., Ltd. Photoelectric device. 3,982,315, Cl. 29-572.000.

Kuck, Mark A.: *See—*
Van Brocklin, Lester; Hansen, George E.; and Kuck, Mark A., 3,983,225.

Kuehn, Riley, Jr., to Boeing Company, The. Method and apparatus for dereeling interleaved tapes. 3,982,987, Cl. 156-361.000.

Kuehne, Gerhard B.: *See—*
Miram, George V.; and Kuehne, Gerhard B., 3,983,446.

Kugisawa, Toshio, to Kabushiki Kaisha Kawai Gakki Seisakusho. Musical-tone signal forming apparatus for electronic musical instrument. 3,982,461, Cl. 84-1.030.

Kugisawa, Toshio: *See—*
Obayashi, Nobuharu; Hashizume, Hikaru; Sakashita, Noriji; Kameyama, Seiji; Ezawa, Sadaaki; Kugisawa, Toshio; Washiyama, Yutaka; Kondo, Tatsunori; and Watanabe, Hironori, 3,982,460.

Kuhn, Edmund W.; and Uber, Jesse L., to Westinghouse Electric Corporation. Enclosed circuit interrupter with improved fuse assembly. 3,983,460, Cl. 317-114.000.

Kuhn, Harland L. Proportional lead guidance. 3,982,714, Cl. 244-3.160.

Kuipers, Jack, to Polhemus Navigation Sciences, Inc. Tracking and determining orientation of object using coordinate transformation means, system and process. 3,983,474, Cl. 324-43.00R.

Kumakura, Minoru: *See—*
Kaetsu, Isao; Kumakura, Minoru; Ito, Akihiko; and Maeda, Yuji, 3,983,083.

Kunik, I. Jordan; and Goodman, Maurice, Jr., to Kunik, I. Jordan; and Goodman, Maurice, Jr., part interest to each. Dispensing case for needles or the like. 3,982,631, Cl. 206-380.000.

Kuno, Akira: *See—*
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Kuntz, Hillard L.: *See—*
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Kunze, Carl Theodore: *See—*
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Kuraray Co., Ltd.: *See—*
Tamai, Yoshin; Nishida, Takashi; Mori, Fumio; Omura, Yoshiaki; Tanomura, Masahisa; Hosogai, Takeo; Ninagawa, Yoichi; and Itoi, Kazuo, 3,983,175.

Kurashiki Boseki Kabushiki Kaisha: *See—*
Muraki, Ryoji; Endo, Masao; Aoki, Nobuaki; Mizutani, Kazuo; and Fukui, Norio, 3,983,217.

Kuratomi, Tatsuo: *See—*
Yatsurugi, Yoshifumi; Kuratomi, Tatsuo; and Takaishi, Tetsuo, 3,982,912.

Kurie, Eugene J.; and Yunghahn, Richard J., to Midland-Ross Corporation. Air-dispensing web-floating apparatus. 3,982,327, Cl. 34-156.000.

Kuroda, Masao: *See—*
Endo, Akira; Kuroda, Masao; Terahara, Akira; Tsujita, Yoshio; and Tamura, Chihiro, 3,983,140.

Kuroishi, Nobuhito: *See—*
Osawa, Makoto; Hagiwara, Yoshitoshi; Kawakita, Takao; Motoyoshi, Kenya; and Kuroishi, Nobuhito, 3,982,905.

Kurozumi, Akira: *See—*
Yamada, Osamu; Kurozumi, Akira; Ishida, Shuichi; Futatsuya, Fumio; Ito, Kensaku; and Yamamoto, Hiroshi, 3,983,176.

Kurze, Joachim: *See—*
Brandeis, Johann; and Kurze, Joachim, 3,983,043.

Kusmierski, Edward C.; Lopez, John R.; and Silverman, Phillip. Can sealer. 3,982,656, Cl. 220-238.000.

Kyowa Hakko Kogyo Co., Ltd.: *See—*
Sumikawa, Shozo; Maida, Rikichi; and Kageyama, Yuriaki, 3,983,170.

L. Schuler GmbH: *See—*
Schneider, Franz; and Braitinger, Helmut, 3,982,454.

La Cellophane: *See—*
Riboulet, Robert; and Charvet, Eugene, 3,983,285.

Lacher, William Arthur, to Burroughs Corporation. Full duplex driver/receiver. 3,983,324, Cl. 178-59.000.

Ladd, David L.; and Ross, Stephen T., to SmithKline Corporation. Certain 4-(3-azacycloalkoxy or azacycloalkylmethoxy)benzoylbenzofurans or benzothiophenes. 3,983,245, Cl. 424-285.000.

Lagervall, Otto Leonard. Foot rests for kayaks. 3,982,293, Cl. 9-7.000.

Lagow, Richard J., to Massachusetts Institute of Technology. Alkali metal organic compounds and their method of preparation. 3,983,182, Cl. 260-665.00R.

Lako, Lajos: *See—*
Meszaros, Lajos; Grega, Jozsef; Lako, Lajos; Marko, Laszlo; Salamon, Zoltan; Szatmari, Istvan; and Tasi, Laszlo, 3,982,736.

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Lamson, Frederick W. Device for converting pallets into a storage rack. 3,982,638, Cl. 214-10.50R.

Lance, Drew R.: *See—*
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Lang, Alexander Craig; and Lunde, Peter Alan, to Santa Fe International Corporation. Submarine pipeline laying vessel. 3,982,402, Cl. 61-109.000.

Langford, Forrest L., to Terminal Data Corporation. Document guide. 3,982,752, Cl. 271-248.000.

Langhammer, Hans Jurgen: *See—*
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Langlois, Gary Norris, to Holosonics, Inc. Detector for use in acoustic holography. 3,983,529, Cl. 340-5.00H.

Langworthy, Colin George: *See—*
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Lapeyronnie, Andre Gabriel, to Fournitures Internationales de Materieles Electroniques. Electronic ignition device for internal combustion engines. 3,982,518, Cl. 123-148.0CB.

Larkin, Terrance M., to Gates Rubber Company, The. Method and apparatus for metering thixotropic battery paste. 3,982,663, Cl. 222-1.000.

Larson, Robert L.: *See—*
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Larsson, Hans Gustav Ingvar; and Stjarnovist, Sven Gunnar Harald, to Marco Materialhantering AB. Hand-operated pallet truck. 3,982,767, Cl. 280-43.120.

Lassen, Frederick O.: *See—*
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Latham, Raymond John; and Holloway, Arthur John, to Imperial Chemical Industries Limited. Quenching of polymeric film. 3,982,863, Cl. 425-135.000.

Laurent, Pierre Alfred. Apparatus for afterburning the exhaust gases of an internal combustion engine to remove pollutants therefrom. 3,982,397, Cl. 60-286.000.

Laurer, George J.: *See—*
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Lauterbach, William L., to United States Steel Corporation. Device for alignment of briquette rolls. 3,982,866, Cl. 425-168.000.

Lauzeral, Jean; and Laville, Christian, to European Atomic Energy Community (Euratom). Method and device for unclogging filter cloths. 3,983,036, Cl. 210-356.000.

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Leavesley, George W.; and Cleavenger, Dever C., to Budd Company, The. Press brake testing apparatus. 3,982,418, Cl. 73-11.000.

Le Blanc, Maurice: *See—*
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Leduc, Malcolm E.: *See—*
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Lee, Jae Yoon; and Lee, Kuem Ja. Apparatus for transfer, storage, and distribution of liquid. 3,983,037, Cl. 210-416.00R.

Lee, James H.; Satya, Akella V. S.; Ghatalia, Ashwin K.; and Thomas, Donald R., to International Business Machines Corporation. Electrical defect monitor structure. 3,983,479, Cl. 324-158.00R.

Lee, Kuem Ja: *See—*
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Lee, Minyoung, to General Electric Company. Process for the preparation of a composite cubic boron nitride layer abrasive body. 3,982,911, Cl. 51-307.000.

Lee, Neville K. S.: *See—*
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Leemhuis, Johannes Antonius Joseph, to Akzona Incorporated. Novel 11β-alkyl steroids of the estrane series. 3,983,144, Cl. 260-397.300.

Leezer, James R.: *See—*
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Lehnert, Stanley E., to Zenith Radio Corporation. Low level pincushion correction system with a dual impedance yoke. 3,983,450, Cl. 315-370.000.

Lehrke, Kenneth E.: *See*—
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Lehto, Timo Kalevi, to Kemira Oy. Removing nitrates with an organic amine salt and ion exchange. 3,983,222, Cl. 423-395.000.

Leis, Michael; and Doane, Russell C., to Digital Equipment Corporation. Scan control circuit for a video terminal display device using feedback to control synchronization. 3,983,451, Cl. 315-387.000.

Leisure Technology, Inc.: *See*—
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L'Esperance, Francis A., Jr. Eye surgical instrument. 3,982,541, Cl. 128-303.100.

Lestage, Joseph C.: *See*—
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Letellier, Jules P., to United States of America, Navy. Fluid gap glan-laser prism. 3,982,819, Cl. 350-157.000.

Letoffe, Michel, to Rhone-Poulenc S.A. Method of coating a substrate with curable organopolysiloxane compositions. 3,983,265, Cl. 427-58.000.

Levatter, Jeffrey I.; Lin, Shao-Chi; and Scott, Paul B., to Xonics, Inc. Spark gap switch. 3,983,438, Cl. 313-146.000.

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Licari, James J.; and Willing, Robert, to Rockwell International Corporation. Composition for boundary lubricant and method. 3,983,270, Cl. 427-372.000.

Lima, Paul J.; and Townsend, Todd V., to Lynch Communication Systems, Inc. Automatic span line switch. 3,983,340, Cl. 179-175.30S.

Limpens, Karl: *See*—
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Lindberg, Arthur F.: *See*—
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Lindblad, Oskar Lennart. Device for tightening of a belt forming part of a safety harness assembly for vehicles. 3,982,775, Cl. 280-744.000.

Linde Aktiengesellschaft: *See*—
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Lindgren, Kenneth; and Erlandsson, Sten, to Verkstadsproduktion I Borlange AB. Adjustable tool positioning structure. 3,982,715, Cl. 248-2.000.

Lindmayer, Joseph; and Allison, James Frederick, to Communications Satellite Corporation (Comsat). Dotted contact fine geometry solar cell. 3,982,964, Cl. 136-89.000.

Lindner, Irmgard: *See*—
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Lipscombe, William Mark, to Feedback Instruments Limited. Current controlled electrical circuits. 3,983,512, Cl. 331-108.00B.

Lissant, Kenneth J., to Petrolite Corporation. Use of emulsions in crowd control. 3,983,213, Cl. 424-170.000.

Litton Business Systems, Inc.: *See*—
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Ljubartovich, Natalya Vasilievna: *See*—
Badenkov, Petr Fedorovich; Portny, Gennady Lazarevich; Muslaev, Igor Mikhailovich; Pukhova, Regina Lazarevna; Roitburd, Isaak Shlemovich; Ljubartovich, Natalya Vasilievna; Rossin, Valery Donovich; Petrokas, Leonid Venediktovich, and Tsaplin, Nikolai Sergeevich, 3,982,989.

Llach, Lawrence; and Picas, Arturo. Variable drive mechanism for carding machine. 3,982,301, Cl. 19-.250.

Llop, Helenio, to Societe d'Optique, Precision Electronique et Mechanique Sopelem. Device for measuring angular deviation of a light beam by use of gratings. 3,983,390, Cl. 250-231.00R.

Loeliger, Peter: *See*—
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Love, Gordon David. Mixing devices. 3,982,700, Cl. 241-46.110.

Love, John J.; and Fleer, Thomas P., to Emerson Electric Co. Mounting means for a domestic gas oven burner orifice member. 3,982,523, Cl. 126-19.00R.

Lovell, Paul L., to Cyclamatic, Inc. Method and apparatus for curing concrete products. 3,982,890, Cl. 432-138.000.

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Lundberg, Charles Andrew, to Richardson-Merrell Inc. Process for the preparation of quinolizinone derivatives. 3,983,122, Cl. 260-289.0AZ.

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Luscher, Jakob; and Rusznyak, Andreas, to Ebauches S.A. Frequency divider. 3,983,411, Cl. 307-225.00C.

Lynch, Brian: *See*—
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Ma, John Y., to Zenith Radio Corporation. Signal overload protection circuit for varactor tuner. 3,983,490, Cl. 325-452.000.

MacDougall, James Bruce, to Andrew Corporation. Cassegrain antenna with improved subreflector for terrestrial communication systems. 3,983,560, Cl. 343-781.0CA.

MacGregor, William Roderick; and Spicer, Dalton Harold, to Deere & Company. Power loader. 3,982,643, Cl. 214-131.00A.

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Madigan, Thomas M., to Itek Corporation. Roller moistening wick system for preventing dripping within a duplicating machine. 3,982,484, Cl. 101-422.000.
Madsen, Harold L. Drapery hanger and manipulator. 3,982,581, Cl. 160-340.000.
Maeda, Yuji: *See—*
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Maekawa, Yukio; and Sakanoue, Seiki, to Fuji Photo Film Co., Ltd. Bis-azo pyrazolone type dye developer and light-sensitive material. 3,982,946, Cl. 96-73.000.
Maes, Roger V. Portable vise. 3,982,739, Cl. 269-37.000.
Mahoney, Edmund J.; and Natanson, Paul S., to Solar Power Corporation. Solar battery maintainer. 3,982,963, Cl. 136-89.000.
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Maior, David G., to Campbell Research Corporation. Food processing system. 3,983,259, Cl. 426-401.000.
Maitrias, Gerard, to Burroughs Corporation. Motor drive system including a feedback loop. 3,983,468, Cl. 318-685.000.
Maker, Paul Manwaring, to Lucas Industries Limited. Electronic fuel control for a gas turbine engine. 3,982,389, Cl. 60-39.16R.
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Malek, Hooshang; and Polan, Alvin F. Directional self containing ear mounted hearing aid. 3,983,336, Cl. 179-107.0FD.
Malgarini, Giansilvio; and Pasero, Edoardo, to Centro Sperimentale Metallurgico S.p.A. Plate for fluid-bed reactors. 3,982,900, Cl. 23-284.000.
Malmberg, Rolf; and Olenfalk, Lars Gustav, to Alfa-Laval AB. Production of milk with predetermined fat content. 3,983,257, Cl. 426-231.000.
Maltese, John; Nesson, Israel; and Mitchell, Robert, to Berkey Photo, Inc. Camera construction. 3,983,570, Cl. 354-86.000.
Mangels, John A., to Ford Motor Company. Method of increasing the oxidation resistance of silicon nitride. 3,983,198, Cl. 264-65.000.
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Maples, H. Eugene. Spraying apparatus. 3,982,697, Cl. 239-289.000.
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Marechal, Gilles, to Societe d'Exploitation des Procedes Marechal S.E.P.M. (Societe Anonyme). Single wire electrical connector. 3,982,808, Cl. 339-88.00R.
Marinis, Spyridon: *See—*
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Marshall, David W.; and Agarwal, Jagdish Chandra, to Kennecott Copper Corporation. Copper filled conductive epoxy. 3,983,075, Cl. 252-511.000.
Martin, Adam Eugene. Pipe connection to manholes and the like. 3,982,777, Cl. 285-192.000.
Martin, John J., to United States of America, Army. Ballistic missile defense system. 3,982,713, Cl. 244-3.100.
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Marzocco, Angelo T. Automatic dog and cat feeder. 3,982,501, Cl. 119-51.140.
Masaki, Kenji; and Saito, Masaaki, to Nissan Motor Co., Ltd. Internal combustion engine exhaust cleaning method and system. 3,982,393, Cl. 60-274.000.
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May, Denis Ronald William, to J. E. Hanger & Company Limited. Alignment device for artificial limbs. 3,982,278, Cl. 3-21.000.
Mayama, Mikao: *See—*
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Mayer, Norbert: *See—*
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Mazzei, Marcello: *See—*
Palladino, Nicola; Mazzei, Marcello; and Marconi, Walter, 3,983,308.
McArthur, Dennis P., to Union Oil Company of California. Process for rejuvenating automobile emission control catalysts. 3,983,052, Cl. 252-412.000.
McCollum, John D.; and Quick, Leonard M., to Standard Oil Company (Indiana). Process for recovering upgraded products from coal. 3,983,027, Cl. 208-8.000.
McCollum, John D.; and Quick, Leonard M., to Standard Oil Company (Indiana). Process for recovering upgraded products from coal. 3,983,028, Cl. 208-9.000.
McConaghy, John S., Jr., to Monsanto Company. Oxidation of unsaturated amines. 3,983,161, Cl. 260-465.900.
McCrary, Lawrence E.: *See—*
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McDaniel, Marvin Lee: *See—*
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McDonald, Bernard. Apparatus for collecting urine sample. 3,982,898, Cl. 23-259.000.
McDonald, Robert N.: *See—*
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McDonnell Douglas Corporation: *See—*
Sharif, Louay E.; and Moore, John R., 3,983,380.
Sheratte, Martin B., 3,983,046.
McDonnell, Richard J. Torsion type arm exercising apparatus. 3,982,757, Cl. 272-134.000.
McGonagle, Joseph D.: *See—*
Faber, Ulbe; Davis, Robert L.; Fisher, David A.; and McGonagle, Joseph D., 3,983,539.
Faber, Ulbe; Davis, Robert L.; Fisher, David A.; and McGonagle, Joseph D., 3,983,541.
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McLain, Robert E., to Rockwell International Corporation. Ultrasonic inspection system. 3,982,425, Cl. 73-67.80S.
McLane, Jack S. Cooking apparatus. 3,982,476, Cl. 99-339.000.
McMurtrie, Charles Louis, to Eastech, Inc. Fluid flow signal processing circuit. 3,982,434, Cl. 73-194.0VS.
McNeil Laboratories, Incorporated: *See—*
Rasmussen, Chris Royce, 3,983,135.
Me-Books Publishing Company: *See—*
Kraynak, Joseph Stephen; and Blumenfield, Arthur, 3,982,744.
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Mecham, William J., to United States of America, Energy Research and Development Administration. Method for storage of solid waste. 3,983,050, Cl. 252-301.10W.
Med-Pro, Ltd.: *See—*
Smith, Gordon E.; and Evans, Donald L., 3,982,307.
Meeuwen, Adolf: *See—*
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Mehta, Bharat C., to Allis-Chalmers Corporation. Belt elevator for bulk material. 3,982,626, Cl. 198-626.000.
Meier, Eugen; and Ellner, Milan, to Mettler Instrumente AG. Dash-pot arrangement for balance. 3,982,738, Cl. 267-121.000.
Mendoza, Fausto Celorio. Method for milling grain while simultaneously cooking the grain. 3,983,261, Cl. 426-473.000.
Menshen, Arnold. Plastic clamping apparatus. 3,982,304, Cl. 24-73.0AP.
Merck & Co., Inc.: *See—*
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Meserow, Francis P.; and Mills, Frank H., to Alston, Inc. Calibration circuit and method. 3,983,480, Cl. 324-169.000.
Messing, Ralph A.; and Odstrchel, Gerald, to Corning Glass Works. Bonding proteins to inorganic supports. 3,983,000, Cl. 195-63.000.
Messing, Ralph A.: *See—*
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Meszaros, Lajos; Grega, Jozsef; Lako, Lajos; Marko, Laszlo; Salamon, Zoltan; Szatmari, Istvan; and Tasi, Laszlo, to Eszakmagyarorszagi Vegyimuvek. Intensification of fluid-fluid transport processes. 3,982,736, Cl. 259-107.000.
Mettler Instrumente AG: *See—*
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Metzger, Karl Georg: *See—*
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Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, 3,983,236.
Meyer, Horst, to Bayer Aktiengesellschaft. Process for the preparation of 4-hydroxy-3-methoxy-phenylacetonitrile. 3,983,151, Cl. 260-465.00F.
Meyer, Horst, to Bayer Aktiengesellschaft. Process for the preparation of hydroxyphenylacetonitriles. 3,983,160, Cl. 260-465.00F.
Meyer, Ruth, to Raymond Lee Organization, Inc., The, a part interest. Shoulder strap holder pin. 3,982,305, Cl. 24-85.00R.
Meyers, Theodore F., to Hobart Corporation. Mounting assembly for food waste disposer. 3,982,703, Cl. 241-100.500.
Meylan, Pierre: *See—*
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Micro-Mega S.A.: *See—*
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Mildern, William D. Valve. 3,982,674, Cl. 222-402.210.
Milicic, Tony, to Irwin Toy Limited. Outdoor game dart. 3,982,762, Cl. 273-106.50B.
Miller, Donald P.: *See—*
Coleman, John F.; Miller, Donald P.; and Hatzmann, John F., 3,982,753.
Miller, Howard. Device for attaching a sink rim to a drainboard. 3,982,287, Cl. 4-187.00A.
Miller, Michael Evans; and Amery, John Gordon, to RCA Corporation. Velocity correction system with damping means. 3,983,318, Cl. 178-6.6DD.
Miller, Miles C.: *See—*
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Miller, Roy W., to Pullman Incorporated. Hopper car door actuating mechanism. 3,982,641, Cl. 214-58.000.
Miller, Stewart Edward, to Bell Telephone Laboratories, Incorporated. Method for forming optical fiber preform. 3,982,916, Cl. 65-3.00A.
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Miram, George V.; and Kuehne, Gerhard B., to Varian Associates. Gridded convergent flow electron gun for linear beam tubes. 3,983,446, Cl. 313-452.000.
Mirtain, Henri J., to Uniroyal S.A. Pneumatic tire. 3,982,579, Cl. 152-361.00R.
Misato, Tomomasa; Huang, Keng Tang; Homma, Yasuo; Shida, Toshiro; and Wakamatsu, Hachiro, to Ajinomoto Co., Inc. Fungicidal compositions and method for protecting plants by the use thereof. 3,983,214, Cl. 424-180.000.
Mr. Tuffy Co.: *See—*
Scimeca, Frank M., 3,982,577.
Mitchell, Larry D.; and Tanner, Murray Q., III, to Affiliated Hospital Products, Inc. Operating table or the like with geometrically compensated differentially movable load sharing multiple hydraulic cylinder and piston arrangement. 3,982,741, Cl. 269-325.000.
Mitchell, Richard Frank; Read, Eileen; and Stevens, Richard, to U.S. Philips Corporation. Acoustic surface wave devices. 3,983,515, Cl. 333-30.00R.
Mitchell, Robert: *See—*
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Mitchell, Robert W., to Photo Systems, Inc. Color filter head for photographic enlargers. 3,982,825, Cl. 350-313.000.
Mitchell, Thomas O.; and Whitehurst, Darrell Duayne, to Mobil Oil Corporation. Synthetic amorphous silicas of predetermined pore distribution method of producing same. 3,983,055, Cl. 252-454.000.
Mitsche, Roy T.; Kuntz, Hillard L.; and Hayes, John C., to Universal Oil Products Company. Preparation of alumina extrudates. 3,983,197, Cl. 264-56.000.
Mitsubishi Chemical Industries Ltd.: *See—*
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Miyazaki, Moritugu, to Mitsui Shipbuilding and Engineering Co., Ltd. Method and apparatus for erecting a vertical structure. 3,982,634, Cl. 212-1.000.
Mizutani, Kazuo: *See—*
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Theissen, Robert J., 3,983,168.
Moczygemba, George A.; Johnson, W. Delmar; and Clark, Earl, to Phillips Petroleum Company. Iodine molecular weight regulators in suspension polymerization systems. 3,983,187, Cl. 260-880.00R.
Moddel, Adolf. Method and device for forming a socket on a plastic tube. 3,982,871, Cl. 425-393.000.
Moe, William West; Lotz, Robert William; Green, Ethan Robert; and Fazio, Rodolfo, to Printing Developments, Inc. Electronic screening for image reproduction. 3,983,319, Cl. 178-6.70R.
Moffitt, Myron L., to Mobil Oil Corporation. Production of heat seals in thermoplastic material with press head having a temperature gradient. 3,982,992, Cl. 156-583.000.
Mogaki, Katsuo: *See—*
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Moll, Hans, to Maschinenfabrik Augsburg-Nurnberg AG. Seat arrangement for a passenger car. 3,982,787, Cl. 297-317.000.
Moller, Tilo: *See—*
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Momiyama, Kikuo; and Agari, Yujiro, to Canon Kabushiki Kaisha. Retrofocus wide-angle objective lens system of large relative aperture. 3,982,823, Cl. 350-214.000.
Monsanto Company: *See—*
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Moon, Roger A., to Ford Motor Company. Electronic-fuel-injection-system enrichment circuit for use during engine cranking. 3,982,519, Cl. 123-179.00L.
Moore, Alvin Edward. Insulated structure of end-joined cans and stuccoed mesh. 3,982,362, Cl. 52-91.000.
Moore, C. Bradley; and Yeung, Edward S., to University of California, The Regents of the. Isotopic separation by photopredissociation. 3,983,020, Cl. 204-157.10R.
Moore, Charles T., to Dayton-Hudson Corporation. Interchangeable price indicating sign. 3,982,342, Cl. 40-5.000.
Moore, John R.: *See—*
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Moore, Leo M., to Industrial Machine Service Company. Hot melt dispensing apparatus and method. 3,982,669, Cl. 222-146.0HE.
Moore, Ronald Lynn: *See—*
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Morita, Akira: *See—*
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Mott, Roger Eugene, to Deere & Company. Harvesting platform with a floating cutter bar. 3,982,383, Cl. 56-11.600.
Moussou, Jean; and Calvet, Robert, to Ceraver. Heat treatment tunnel kiln for products having a circular cross-section. 3,982,888, Cl. 432-128.000.
Moy, Franklin. Active filter. 3,983,504, Cl. 330-107.000.
Mt. Lassen Cinder Company: *See—*
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Mulleneers, Jan Joseph Mattheus, to U.S. Philips Corporation. Apparatus for adjusting the filament current of an X-ray tube. 3,983,396, Cl. 250-402.000.
Muller, Hans, to Grapha-Holding AG. Method and arrangement for storing and transporting paper sheets. 3,982,642, Cl. 214-301.000.
Muller, Jacques: *See—*
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Muraki, Ryoji; Endo, Masao; Aoki, Nobuaki; Mizutani, Kazuo; and Fukui, Norio, to Kurashiki Boseki Kabushiki Kaisha. Method for removing sulfur dioxide from waste gases. 3,983,217, Cl. 423-242.000.
Murayama, Fumio: *See—*
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Murer, Angelo; and Borsatti, Mario, to Exxon Research and Engineering Company. Rigid or semirigid foams and process of making them. 3,983,295, Cl. 428-315.000.
Muriot, Edward E., to Health Technology Labs, Inc. Medical/surgical suction equipment. 3,982,539, Cl. 128-276.000.
Murray, James M. Dish stabilizing mechanisms for dish-washing machines. 3,982,799, Cl. 312-270.000.
Murray, Leo Thomas, to Colgate-Palmolive Company. Bleaching and detergent compositions having imide activator and peroxygen bleach. 3,982,891, Cl. 8-111.000.
Murthi, Varanasi Aruna; Jain, Padam Chand; Sharma, Jitendra Nath; Srimal, Rikhab Chand; Dhawan, Bhola Nath; and Anand, Nitya, to Council of Scientific and Industrial Research. 1-Substituted 4-(β-2-quinolylethyl)piperazines and 1,2,3,4-tetrahydroquinolyl-ethyl analogues thereof. 3,983,121, Cl. 260-268.0BQ.
Muslaev, Igor Mikhailovich: *See—*
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laev, Igor Mikhailovich; Pukhova, Regina Lazarevna; Roitburd, Isaak Shlemovich; Ljubartovich, Natalya Vasilievna; Rossin, Valery Donovich; Petrokas, Leonid Venediktovich; and Tsaplin, Nikolai Sergeevich, 3,982,989.

Naarmann, Herbert: *See—*
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Nabae, Akira; and Shimamura, Takeo, to Tokyo Shibaura Denki Kabushiki Kaisha. Method and apparatus for controlling the speed of induction motors. 3,983,463, Cl. 318-227.000.

Naden, Rex Alan, to Texas Instruments Incorporated. Programmable arithmetic and logic bubble arrangement. 3,983,383, Cl. 235-176.000.

Nagai, Kunio; and Akutagawa, Tooru, to Sony Corporation. Color saturation and contrast control circuitry responsive to ambient light. 3,983,575, Cl. 358-27.000.

Nagai, Yasutaka; Uno, Hitoshi; Shimizu, Masanao; and Karasawa, Tadahiko, to Dainippon Pharmaceutical Co., Ltd. Hexahydro-γ-carboline derivatives and their salts. 3,983,239, Cl. 424-267.000.

Nagaoka, Tadahiko: *See—*
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Nagel, Martin J.: *See—*
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Najvar, Daniel J.; and Hawkins, Jerry M., to Dow Chemical Company, The. Acrylate and methacrylate monomers. 3,983,167, Cl. 260-486.00R.

Nakada, Akira: *See—*
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Nakagawa, Yasuhiko; and Nakai, Meroji, to Nissan Motor Co., Ltd. Carburetor for torch ignited engine. 3,982,513, Cl. 123-119.00D.

Nakai, Meroji: *See—*
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Nakajima, Norio, to Caterpillar Mitsubishi Ltd. Emergency brake system for a vehicle. 3,982,792, Cl. 303-6.00A.

Nakamura, Shinji: *See—*
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Nakanishi, Shinichiro, to West Electric Company, Ltd. Automatic strobo flash device. 3,983,448, Cl. 315-151.000.

Nakano, Kazuo: *See—*
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Nakayama, Koji. Antenna adapter for television. 3,983,563, Cl. 343-861.000.

Nakayama, Osamu, to Nippon Electric Company, Ltd. Connector for light-transmitting cables. 3,982,815, Cl. 350-96.00C.

Nakazawa, Mitsunobu; Araki, Yoshiaki; Haruta, Masahiro; and Satomi, Kunio, to Canon Kabushiki Kaisha. Image recording member. 3,983,564, Cl. 346-1.000.

Nalco Chemical Company: *See—*
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Nannichi, Yasuo: *See—*
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Narayanan, Venkatachala Lakshmi; and Haugwitz, Rudiger D., to E. R. Squibb & Sons, Inc. Anthelmintic isothiocyanobenzoxazoles. 3,983,130, Cl. 260-307.00D.

Narco Scientific Industries, Inc.: *See—*
Powell, Ronald Lee; and Smith, Frank Patterson, II, 3,983,557.

Narita, Hiroshi: *See—*
Tsuboi, Takashi; Narita, Hiroshi; and Higuchi, Toru, 3,983,465.

Nasyrov, Gakif Zakirovich; Kaluzhsky, Nikolai Andreevich; and Kostin, Vladimir Nikolaevich. Method of producing alumina and potassium sulphate form alunite. 3,983,211, Cl. 423-128.000.

Natanson, Paul S.: *See—*
Mahoney, Edmund J.; and Natanson, Paul S., 3,982,963.

National Computer Systems, Inc.: *See—*
Firehammer, John D.; and Gruebele, Dale W., 3,983,364.

National Research Development Corporation: *See—*
Bradley, Daniel Joseph; and Hutchinson, Marcus Henry Ritchie, 3,983,508.

National Steel Corporation: *See—*
Peters, Gordon L.; and Saunders, William T., 3,983,305.

Nauta, Drewes Jan, to Machinefabriek en Constructiewerkplaats Gebr. Klinkenberg B.V. Silo or reservoir for free flowing solid material. 3,982,640, Cl. 214-17.0CB.

Nayar, Harbhajan S., to Viking Metallurgical Corporation. Metal rings made by the method of particle ring-rolling. 3,982,904, Cl. 29-182.000.

Nazzer, Don Barkley; and Thayer, Victor R., to Canada, Atomic Energy of, Limited. Gas stripping and recirculation process in heavy water separation plant. 3,983,226, Cl. 423-580.000.

Neal, David A.; and Stone, Patrick L. Method and apparatus for destructive distillation of solid wastes and recovery of distilled products. 3,983,009, Cl. 202-93.000.

Neles Oy: *See—*
Nelimarkka, Juha Antti E., 3,982,727.

Nelimarkka, Juha Antti E., to Neles Oy. Flangeless valve. 3,982,727, Cl. 251-152.000.

Nelson, Charles C.: *See—*
Wilson, Phillip M.; Erickson, John W.; Nelson, Charles C.; and Budrys, Vitolis, 3,982,589.

Nelson, Norman A., to Upjohn Company, The. 5-Oxa phenyl- and phenoxy-substituted prostaglandin *β*, analogs. 3,983,163, Cl. 260-473.00A.

Nelson, William B., Jr. Method for automatically fastening deck boards to stringers. 3,982,313, Cl. 29-432.000.

Nemoto, Mitsuo, to Kabushiki Kaisha Audio-Technica. Stylus assembly and transducer using same. 3,983,335, Cl. 179-100.41K.

Nemoto, Tadashi: *See—*
Ariga, Keiji; Nemoto, Tadashi; and Yasunaka, Kenji, 3,982,314.

Nenner, Johannes: *See—*
Kendziora, Heinz; Nenner, Johannes; Schoer, Heinz; and Schultze, Werner, 3,982,887.

Nesson, Israel: *See—*
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Neuray, Dieter: *See—*
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New England Envelope Manufacturing Co.: *See—*
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Newall, Christopher Earle: *See—*
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Newell, George F., to Westinghouse Electric Corporation. Television system for the display of visuals with high resolution. 3,983,328, Cl. 178-6.800.

Newhouse, Vernon L.; and Cooper, George R., to Purdue Research Foundation. Random signal flaw detector system. 3,982,426, Cl. 73-67.900.

Newman, Donald J.: *See—*
Conder, Terrence M.; and Newman, Donald J., 3,982,822.

Newman, Ernest L. Mobile home roof apparatus. 3,982,360, Cl. 52-22.000.

Newman, Frederick S.; Hartman, John T.; and Dedona, Francis A., to Scionics Corporation, The. Anodizing means and techniques. 3,983,014, Cl. 204-58.000.

Newman, Gerald Henry, to Union Carbide Corporation. Non-aqueous battery system. 3,982,958, Cl. 429-57.000.

Ney, Robert; and Rhiem, Hans-Christoph, to Lynenwerk KG. Electric cables. 3,983,313, Cl. 174-121.0SR.

Nichols, Herbert F., to Bauman, Joel. Semiconductor switching circuit. 3,983,415, Cl. 307-255.000.

Nick, Kurt: *See—*
Pfarrwaller, Erwin; and Nick, Kurt, 3,982,567.

Nicolson, Alexander M.; and Mara, Richard M., to Sperry Rand Corporation. Detector having a constant false alarm rate. 3,983,422, Cl. 307-322.000.

Nielinger, Werner; Dhein, Rolf; Haberland, Ulrich; Michael, Dietrich; and Hermann, Karl-Heinz, to Bayer Aktiengesellschaft. Composite sheet structures. 3,983,306, Cl. 428-474.000.

Niemand, Carolyn M.: *See—*
Norris, Helen R.; Niemand, Carolyn M.; and Andreas, David W., 3,983,256.

Nihon Beru-Haueru Kabushiki Kaisha (Bell & Howell Japan, Ltd.): *See—*
Saito, Fumio, 3,982,826.

Nihon Dengyo Co., Ltd.: *See—*
Hodama, Takuo, 3,983,484.

Nilssen, Ole K.: *See—*
Goss, Stanley B.; Nagel, Martin J.; and Nilssen, Ole K., 3,983,550.

Nilsson, Lennart. Reversible slide-on digger tooth with easy removal arrangement. 3,982,339, Cl. 37-141.00T.

Ninagawa, Yoichi: *See—*
Tamai, Yoshin; Nishida, Takashi; Mori, Fumio; Omura, Yoshiaki; Tanomura, Masahisa; Hosogai, Takeo; Ninagawa, Yoichi; and Itoi, Kazuo, 3,983,175.

Nippon Electric Company, Ltd.: *See—*
Hayashi, Izuo; and Nannichi, Yasuo, 3,983,510.
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Nakayama, Osamu, 3,982,815.
Tan, Yoichi, 3,983,499.
Yasuda, Susumu; and Mimitsuka, Takao, 3,983,445.

Nippon Hume Pipe Company Limited: *See—*
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Nippon Kayaku Kabushiki Kaisha: *See—*
Yamada, Osamu; Kurozumi, Akira; Ishida, Shuichi; Futatsuya, Fumio; Ito, Kensaku; and Yamamoto, Hiroshi, 3,983,176.

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Nippon Sheet Glass Co., Ltd.: *See—*
Ohsato, Nobuyoshi; Sono, Kenzo; and Tanaka, Keihachiro, 3,983,527.

Nippon Soda Company Limited: *See—*
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Nippon Soken, Inc.: *See—*
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Katsuoka, Ritsu; and Kawai, Hisasi, 3,983,369.
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Nippon Telegraph and Telephone Public Corporation: *See—*
Hirai, Masataka; Takahashi, Toshio; Arita, Kishio; Yamauchi, Goro; and Kubo, Shugo, 3,982,906.

Nippondenso Co., Ltd.: *See—*
Ishikawa, Kanichi; and Iijima, Kazumi, 3,982,680.
Itoh, Katsumi; and Mori, Kazumasa, 3,983,471.

Nishida, Takashi: *See—*
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Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; Satoh, Masaaki; Ohba, Katsuhiro; Nakamura, Shinji; Sawada, Tatsuo; Ohsaki, Nobuhide; Itoh, Yasuo; Suda, Nobuaki; Okabe, Yasuhisa; and Ozaki, Hideaki, 3,983,500.
Nishinakagawa, Motoshi, to Alps Motorola, Inc. Two-channel and four-channel cartridge tape player. 3,983,579, Cl. 360-78.000.
Nishizaki, Syunichiro; Teratani, Hiroshi; Fujisawa, Osamu; Fukushima, Jiro; Tokizawa, Makoto; Wakabayashi, Nobukatsu; and Saito, Takashi, to Mitsubishi Chemical Industries Ltd.; and Mitsubishi Denki Kabushiki Kaisha. Electrically insulating prepreg. 3,983,289, Cl. 428-268.000.
Nishizawa, Yasuhiro: *See—*
Hattori, Katsuji; Fukai, Masakazu; Moriyama, Akio; and Nishizawa, Yasuhiro, 3,982,820.
Nissan Motor Co., Ltd.: *See—*
Masaki, Kenji; and Saito, Masaaki, 3,982,393.
Nakagawa, Yasuhiko; and Nakai, Meroji, 3,982,513.
Takao, Hiroshi; Togawa, Kinmochi; and Matoba, Kazuo, 3,982,981.
Yamane, Kimitaka; Ueno, Zene; Morita, Akira; Nagaoka, Tadahiko; and Iwaki, Shigeo, 3,982,878.
Niswender, Gordon Dean, to Micromedic Diagonistics, Inc. Thyroxine- and triiodothyronine-tyrosine dipeptide derivatives. 3,983,099, Cl. 260-112.50R.
Nixdorf Computer AG: *See—*
Holland-Letz, Guenter, 3,982,677.
Nobbe, Paul J. Production line apparatus for producing concrete floors. 3,982,874, Cl. 425-424.000.
Nobel Hoechst Chimie: *See—*
Christidis, Yani; and Vallejos, Jean-Claude, 3,983,114.
Noble, Roger K.: *See—*
Schwartz, Robert E.; and Noble, Roger K., 3,982,881.
Noel, Albert D. G., deceased; and by Noel, Josette D., sole heir. Distribution blocks for the formation of joints resisting to differential settling and joints obtained by using said blocks. 3,982,365, Cl. 52-125.000.
Noel, Josette D., sole heir: *See—*
Noel, Albert D. G., deceased; and Noel, Josette D., sole heir, 3,982,365.
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, to Nippon Soken, Inc. Internal combustion engine. 3,982,504, Cl. 123-32.0SP.
Norback, Per Gunnar, to Aktiebolaget Carl Munters. Liquid-gas contact apparatus and method for making the same. 3,983,190, Cl. 261-111.000.
Nordgren, Hans-Elov. Fastening device in collapsible containers. 3,982,652, Cl. 220-7.000.
Norlin, Bertil; and Olsson, Karl Oscar, to Akermans Verkstad AB. Speed regulators for internal combustion engines, particularly diesel engines, in earth movers and workers. 3,982,508, Cl. 123-97.00R.
Norris, Helen R.; Niemand, Carolyn M.; and Andreas, David W., to Pillsbury Company, The. Precooked farinaceous foods adapted for microwave heating and a syrup topping therefor. 3,983,256, Cl. 426-94.000.
Norris, Philip John, to W. Canning & Company Limited. Treatment of the surfaces of polyphenylene oxide materials. 3,983,267, Cl. 427-307.000.
North Electric Company: *See—*
Wallace, Kenneth A., 3,983,418.
Northern Traffic & Signal Systems Ltd.: *See—*
Corrigan, Thomas B., 3,983,531.
Northrop Corporation: *See—*
Rookey, Earl T., 3,982,399.
Northrup, Karl A., to Xerox Corporation. Multiple pinch incandescent lamp. 3,983,441, Cl. 313-222.000.
Norwine, Andrew C.: *See—*
Gannett, Danforth K.; and Norwine, Andrew C., 3,983,327.
Notari, Bruno: *See—*
Fattore, Vittorio; and Notari, Bruno, 3,983,054.
NSM Apparatebau GmbH Kommanditgesellschaft: *See—*
Kortenhaus, Dieter, 3,982,620.
Nutt, Ronald; Milam, Kelly; and Williams, Charles W., to Ortec Incorporated. Digital intervalometer. 3,983,481, Cl. 324-186.000.
N.V. Internationale Octrooi Maatschappij "Octropa": *See—*
Sharpe, Anthony Nelson, 3,982,538.
Nystuen, David L.: *See—*
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Nystuen, Marcus I.: *See—*
Kleimola, David L.; Nystuen, Marcus I.; and Nystuen, David L., 3,982,666.
Obayashi, Nobuharu; Hashizume, Hikaru; Sakashita, Noriji; Kameyama, Seiji; Ezawa, Sadaaki; Kugisawa, Toshio; Washiyama, Yutaka; Kondo, Tatsunori; and Watanabe, Hironori, to Kabushiki Kaisha Kawai Gakki Seisakusho. Musical-tone-waveform forming apparatus for an electronic musical instrument. 3,982,460, Cl. 84-1.030.
Obenshain, David Noel, to Westvaco Corporation. Parallel action jogger. 3,982,751, Cl. 271-221.000.
Obert, Peter: *See—*
Schonwald, Siegfried; and Obert, Peter, 3,982,848.
O'Brien, William J.; and Sakal, John, to Standard Register Company, The. Direct mail advertising booklet and method of production. 3,982,746, Cl. 270-37.000.
Ochs, Paul. Fluid pressure control valve. 3,982,558, Cl. 137-455.000.
Ochs, Paul. High temperature fluid pressure control valve. 3,982,559, Cl. 137-455.000.
Oda, Osamu; Sakai, Kiyoshi; Yusa, Takashi; and Katano, Hamako, to Sankyo Company Limited. 9-Oxo-11α-hydroxymethyl-15ε-hydroxy-prost-13(trans)-enoic acid derivatives and process for the preparation thereof. 3,983,152, Cl. 260-468.00D.
Oda, Yasuyoshi: *See—*
Kikuzawa, Kenji; Sasaguri, Kilchiro; Oda, Yasuyoshi; Sano, Hiroshi; and Okina, Katsumi, 3,983,184.
Odenthal, Conrad John, to Tektronix, Inc. Dual beam CRT with inner gun and outer gun shield means for correcting keystone distortion. 3,983,444, Cl. 313-413.000.
Odstrchel, Gerald: *See—*
Messing, Ralph A.; and Odstrchel, Gerald, 3,983,000.
Oesterlein, Fritz: *See—*
Seitz, Karl; Begrich, Rainer; Riat, Henri; and Oesterlein, Fritz, 3,983,115.
Oettinger, Peter E., to Thermo Electron Corporation. Optical device with liquid coating. 3,982,818, Cl. 350-157.000.
O'Farrell, Charles P.: *See—*
Baldwin, Francis P.; Malatesta, Alberto; and O'Farrell, Charles P., 3,983,062.
Offermann, Paul F., to Chevron Research Company. Means for sectionally increasing the heat output in a heat-generating pipe. 3,983,360, Cl. 219-301.000.
Offshore Company, The: *See—*
Steddum, Riddle E., 3,982,492.
Ogawa, Akira: *See—*
Shiba, Keisuke; Takei, Haruo; Sato, Akira; and Ogawa, Akira, 3,982,950.
Ohba, Katsuhiro: *See—*
Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; Satoh, Masaaki; Ohba, Katsuhiro; Nakamura, Shinji; Sawada, Tatsuo; Ohsaki, Nobuhide; Itoh, Yasuo; Suda, Nobuaki; Okabe, Yasuhisa; and Ozaki, Hideaki, 3,983,500.
Ohba, Kazumasa: *See—*
Matsui, Masanao; Mori, Kenji; Kitahara, Takeshi; Kitamura, Seiichi; and Ohba, Kazumasa, 3,983,134.
Ohi, Reiichi; Shimada, Takeo; and Oishi, Yasushi, to Fuji Photo Film Co., Ltd. Antifoggant dispersion for color photographic materials. 3,982,944, Cl. 96-56.000.
Ohno, Masaharu, to Sony Corporation. FM-AM converter. 3,983,487, Cl. 325-315.000.
Ohsaki, Nobuhide: *See—*
Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; Satoh, Masaaki; Ohba, Katsuhiro; Nakamura, Shinji; Sawada, Tatsuo; Ohsaki, Nobuhide; Itoh, Yasuo; Suda, Nobuaki; Okabe, Yasuhisa; and Ozaki, Hideaki, 3,983,500.
Ohsato, Nobuyoshi; Sono, Kenzo; and Tanaka, Keihachiro, to Nippon Sheet Glass Co., Ltd. Humidity-sensitive sensor. 3,983,527, Cl. 338-35.000.
Ohuchi, Keishi; Matsui, Kenzo; and Tamai, Keizo, to Toyo Kohan Co., Ltd. Mold for forming glass articles. 3,983,293, Cl. 428-306.000.
Ohya, Takaichi; Yokoi, Nobumasa; and Mase, Tamio, to Amano Pharmaceutical Co., Ltd. Process for preparation of cellulase. 3,983,002, Cl. 195-66.00R.
Oishi, Yasushi: *See—*
Ohi, Reiichi; Shimada, Takeo; and Oishi, Yasushi, 3,982,944.
Okabe, Kei; Mayama, Mikao; and Matsuura, Shinzo, to Shionogi & Co., Ltd. Antibiotic siomycin A derivatives and production thereof. 3,983,230, Cl. 424-117.000.
Okabe, Yasuhisa: *See—*
Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; Satoh, Masaaki; Ohba, Katsuhiro; Nakamura, Shinji; Sawada, Tatsuo; Ohsaki, Nobuhide; Itoh, Yasuo; Suda, Nobuaki; Okabe, Yasuhisa; and Ozaki, Hideaki, 3,983,500.
Okina, Katsumi: *See—*
Kikuzawa, Kenji; Sasaguri, Kilchiro; Oda, Yasuyoshi; Sano, Hiroshi; and Okina, Katsumi, 3,983,184.
Okubo, Tsuneo; and Ise, Norio. Method of producing high molecular derivatives. 3,983,097, Cl. 526-49.000.
Olenfalk, Lars Gustav: *See—*
Malmberg, Rolf; and Olenfalk, Lars Gustav, 3,983,257.
Olin Corporation: *See—*
Ralston, Richard W., Jr., 3,983,025.
Schiessl, Henry W.; Kaufman, John D.; and Csejka, David A., 3,983,048.
Ollinger, Max; and Markwitz, Wernhard, to Siemens Aktiengesellschaft. Method of establishing synchronism between teletypewriter transmitter and teletypewriter receiver. 3,983,325, Cl. 178-69.50R.
Ollis, Raymond, Jr.; and Thomas, William J., to Standard Pressed Steel Co. Thread forming self-locking screw. 3,982,575, Cl. 151-22.000.
Olson, Benjamin F. Preheating system for aluminum remelt furnace. 3,982,889, Cl. 432-128.000.
Olson, Donald N.: *See—*
Flatau, Abraham; Olson, Donald N.; and Miller, Miles C., 3,982,489.
Olson, Jerome A. Nail driving apparatus. 3,982,678, Cl. 227-63.000.
Olsson, Karl Oscar: *See—*
Norlin, Bertil; and Olsson, Karl Oscar, 3,982,508.
Olstowski, Franciszek, to Dow Chemical Company, The. Solid, rapid-setting, rigid polyurethanes. 3,983,063, Cl. 260-30.200.

Olstowski, Franciszek, to Dow Chemical Company, The. Solid, rapid-setting, rigid polyurethanes. 3,983,064, Cl. 260-30.200.

Olstowski, Franciszek, to Dow Chemical Company, The. Solid, rapid-setting, rigid polyurethanes. 3,983,065, Cl. 260-30.40N.

Olstowski, Franciszek, to Dow Chemical Company, The. Solid, rapid setting, rigid polyurethanes. 3,983,066, Cl. 260-30.40N.

Olstowski, Franciszek, to Dow Chemical Company, The. Solid, rapid-setting, rigid polyurethanes. 3,983,068, Cl. 260-33.20R.

Olstowski, Franciszek, to Dow Chemical Company, The. Solid, rapid-setting, rigid polyurethanes. 3,983,069, Cl. 260-33.8UB.

Omura, Yoshiaki: *See*—
Tamai, Yoshin; Nishida, Takashi; Mori, Fumio; Omura, Yoshiaki; Tanomura, Masahisa; Hosogai, Takeo; Ninagawa, Yoichi; and Itoi, Kazuo, 3,983,175.

Ono, Tomoyoshi; and Matsuguma, Yoshihiko, to Teijin Limited. Pressure-sensitive adhesive tape or drape. 3,983,297, Cl. 428-355.000.

Opinsky, Jerome L.; and Stewart, Ralph D., to Uniroyal, Inc. Recessed last and method of lasting and molding a shoe sole to upper including positioning insole in recessed last. 3,983,204, Cl. 264-244.000.

Opittek, Eugene W.: *See*—
Ketcham, David J.; Lowe, Roger W.; Pruznick, Michael D.; and Opittek, Eugene W., 3,983,320.

Oppici, Ernesto; and Gianantonio, Anacleto, to Gruppo Lepetit S.p.A. Process for recovering cephalosporin C from A fermentation broth as the N-(p-nitrobenzoyl) derivative. 3,983,109, Cl. 260-243.00C.

Opti-Holding AG: *See*—
Heimberger, Helmut, 3,982,988.

OR-DA Industries Ltd.: *See*—
Solomon, Arieh, 3,982,331.

Orloff, Daniel L.; and Johnson, Charles H., to Oscar Mayer & Co. Inc. Mold with plug take-up mechanism. 3,982,477, Cl. 99-351.000.

Orloff, Leslie: *See*—
Biagi, Alvaro D.; Silbiger, Richard; and Orloff, Leslie, 3,983,561.

Orme, Myrl E., to Bendix Corporation, The. Gimbaled sheave with cable angle sensors. 3,982,733, Cl. 254-173.00R.

Ortec Incorporated: *See*—
Nutt, Ronald; Milam, Kelly; and Williams, Charles W., 3,983,481.

Ortho Pharmaceutical Corporation: *See*—
Kanojia, Ramesh Maganlal, 3,983,112.

Osawa, Makoto; Hagiwara, Yoshitoshi; Kawakita, Takao; Motoyoshi, Kenya; and Kuroishi, Nobuhito, to Honda Giken Kogyo Kabushiki Kaisha; and Sumitomo Electric Industries, Ltd. Porous valve seat materials for internal combustion engines. 3,982,905, Cl. 29-182.500.

Oscar Mayer & Co. Inc.: *See*—
Orloff, Daniel L.; and Johnson, Charles H., 3,982,477.

O'Shea, Francis X., to Uniroyal, Inc. Thermally stable polyurethane elastomers produced from poly(oxypropylene)-poly(oxyethylene)glycols of high oxyethylene group content. 3,983,094, Cl. 260-77.5AM.

Oswald, Arno: *See*—
Knorr, Eberhard; Grunwald, Thomas Ludwig; and Oswald, Arno, 3,982,582.

Ota, Tunezo. Mitt type shoe cleaner. 3,982,298, Cl. 15-106.000.

Otsuka, Misao. Strut spring compressor. 3,982,730, Cl. 254-10.500.

Ott, Eugene Gray, to Dresser Industries, Inc. Rock boring cutter with replaceable cutting elements. 3,982,595, Cl. 175-373.000.

Otto, Willard G.: *See*—
Hentz, Lyle J.; and Otto, Willard G., 3,982,979.

Outboard Marine Corporation: *See*—
Blanchard, Clarence E., 3,982,496.

Overbye, Milan R., to Lewis Refrigeration Co. Individual quick-freezing of moist articles using deep fluidized bed and input conditioner. 3,982,404, Cl. 62-57.000.

Ovshinsky, Stanford R., to Energy Conversion Devices, Inc. Method and apparatus for recording information. 3,983,542, Cl. 340-173.00R.

Ovutime, Inc.: *See*—
Schuster, Samuel R., 3,982,423.

Owens-Illinois, Inc.: *See*—
David, Frank A., 3,982,684.
DeLeon, Isrrael M.; and Thompson, Edward D., 3,982,632.
Spanoudis, Louis, 3,982,584.
Uhlig, Albert R., 3,983,199.

Oxe, Josef; and Keller, Rudolf, to Ciba-Geigy Corporation. Process for the permanent finishing of fiber materials. 3,983,061, Cl. 260-29.6MN.

Oxy Metal Industries Corporation: *See*—
Richardson, John L.; Segovia, Gilbert; and Lewis, Clarke H., 3,983,194.

Oy Paramic AB: *See*—
King, William Clyde, 3,983,528.

Ozaki, Hideaki: *See*—
Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; Satoh, Masaaki; Ohba, Katsuhiro; Nakamura, Shinji; Sawada, Tatsuo; Ohsaki, Nobuhide; Itoh, Yasuo; Suda, Nobuaki; Okabe, Yasuhisa; and Ozaki, Hideaki, 3,983,500.

Padovani, Francois A.: *See*—
Schroen, Walter H.; Padovani, Francois A.; and Hentzschel, Hanspeter P. K., 3,983,264.

Paetzold, Walter J.: *See*—
Bird, Thomas C.; and Paetzold, Walter J., 3,982,483.

Palagos, Miguel Coll, to Stauffer Chemical Company. Aluminum chromate protective coatings for aluminum. 3,982,951, Cl. 106-14.000.

Palladino, Nicola; Mazzei, Marcello; and Marconi, Walter, to Snam Progetti S.p.A. Process for making degradable polymers and degradable polymers obtained thereby. 3,983,308, Cl. 526-1.000.

Palyi-Hansen International APS: *See*—
Palyi, Leslie, 3,982,704.

Palyi, Leslie, to Palyi-Hansen International APS. Grinding disk for disk mills. 3,982,704, Cl. 241-298.000.

Pando, Donald J. Communications device arranged to be worn in intimate contact with the body of a user. 3,983,483, Cl. 325-16.000.

Pangle, James C., Jr.; and Hicks, Alton D., to Dan River Inc. Yarn sizes, sizing treatments and resulting sized yarns. 3,983,271, Cl. 427-390.000.

Panzone, Gianbattista: *See*—
Tarzia, Giorgio; and Panzone, Gianbattista, 3,983,127.

Papa, Sisto Sergio; Condo, Antonino; and Ferrario, Renzo, to Aziende Colori Nazionali Affini ACNA S.p.A. Water-soluble polyazo compound derived from 4-4-diaminobenzanilide. 3,983,101, Cl. 260-144.000.

Parcor: *See*—
Amselem, Armand, 3,983,125.

Park Lane Research Corporation: *See*—
Peck, Raymond A.; and Yarrish, Leon J., 3,982,705.

Parke, Davis & Company: *See*—
Kee Woo, Peter Wing; and Haskell, Theodore Herbert, 3,983,102.

Parks, Joel H., to University of Southern California, The. Radiation detector employing acoustic surface waves. 3,983,424, Cl. 310-8.100.

Parlour, A. Kenneth; Leezer, James R.; and Turpin, Charles H., to Pillsbury Company, The. Spiral wound can with provision for printing lower side of label. 3,982,686, Cl. 229-51.0BP.

Parsons, Brian Jeremy; and Pursell, Lynne Margaret, to Hawker Siddeley Dynamics Limited. Reliability of random access memory systems. 3,983,537, Cl. 340-172.500.

Partridge, Bernard Austin; Jenkins, Thomas Rhys; and McGuire, Michael, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Industry in Her Britannic Majesty's Government of the. Sodium-sulphur battery cells. 3,982,959, Cl. 429-163.000.

Partyka, Richard Anthony: *See*—
Beverung, Warren Neil; and Partyka, Richard Anthony, 3,983,120.
Beverung, Warren Neil, Jr.; Partyka, Richard Anthony; and Jenks, Thomas Andrew, 3,983,119.

Pascal, Andre: *See*—
Csakvary, Etienne; and Pascal, Andre, 3,983,368.

Pasero, Edoardo: *See*—
Malgarini, Giansilvio; and Pasero, Edoardo, 3,982,900.

Passler, Herbert E., to Honeywell Information Systems, Inc. Circuit board spacer. 3,983,459, Cl. 317-101.0DH.

Patten, Michael Allen, to International Business Machines Corporation. Conference call circuitry for TDM signal exchange. 3,983,332, Cl. 179-1.0CN.

Pattison, Victor A.; and Carr, Russell L. K., to Hooker Chemicals & Plastics Corporation. Immonium salts and derivatives thereof. 3,983,178, Cl. 260-621.00R.

Paul, Fred R., Jr.: *See*—
Krogseng, Gerald P.; and Paul, Fred R., Jr., 3,982,536.

Paulson, Donald C.: *See*—
Groleau, Rodney J.; and Paulson, Donald C., 3,982,440.

Pavelle, Richard; and Ferber, Leon A. Holder for tissue boxes. 3,982,717, Cl. 248-313.000.

Payne, William P., to Sun Oil Company (Delaware). Apparatus for connecting submarine pipelines to offshore structures. 3,982,776, Cl. 285-24.000.

Peach, Robert W. Apparatus for measuring metacentric height of a ship. 3,982,424, Cl. 73-65.000.

Peacock Laboratories, Inc.: *See*—
Bahls, Harry, 3,983,266.

Peake, Clinton Joseph: *See*—
Gibbons, Loren Kenneth; Peake, Clinton Joseph; and Harnish, Wayne Nelson, 3,983,246.

Pearson, David B., to Weston Instruments, Inc. Moving coil instrument having electrically conductive coil form parts connected to the coil. 3,983,478, Cl. 324-154.00R.

Pearson, Glenn A. Durable press composition and process. 3,983,269, Cl. 427-370.000.

Pease, Bobbylee, to Clark Equipment Company. Side shift and skewing device for van carrier. 3,982,644, Cl. 214-394.000.

Peck, Raymond A.; and Yarrish, Leon J., to Park Lane Research Corporation. Sliderless shuttle and wire guide assembly. 3,982,705, Cl. 242-4.00B.

Pekic, Branislav; Mladenovic, Vladislav; and Cvetkovic, Dragan, to Zdravlje fabrika farmaceutskih i hemijskih proizvoda. Novel agent for treatment of dehydrations in veterinary medicine, process for preparation and new use thereof. 3,983,232, Cl. 424-180.000.

Pelc, Wladyslaw: *See*—
Dear, Peter Adrian; and Pelc, Wladyslaw, 3,983,449.

Pellegrini, Giovanni: *See*—
Arsura, Emilio; Baruffini, Agostino; Gialdi, Franco; Pellegrini, Giovanni; Ponci, Riccardo; and Scrivani, Pietro, 3,982,931.

Pender, David R. Apparatus for transporting and erecting modular housing system. 3,982,732, Cl. 254-139.100.

Peng, Song-Tsuen: *See*—
Tamir, Theodor; and Peng, Song-Tsuen, 3,982,810.

Penneck, Richard John, to Raychem Corporation. Polymeric adhesive. 3,983,070, Cl. 260-38.000.

Pennington, John James. Display device. 3,982,633, Cl. 211-4.000.
PerCare, Inc.: *See—*
Ackerman, Don; and Schwartztol, Robert Ira, 3,983,277.
Perfect, Frederick H., to Reading Alloys, Inc. Process for producing carbide addition agents. 3,982,924, Cl. 75-.5BA.
Perrin, Arthur, to American Volkscastle International Inc. Wall construction and method to make same. 3,982,368, Cl. 52-381.000.
Perronnet, Jacques; Taliani, Laurent; Girault, Pierre; and Poittevin, Andre, to Roussel-UCLAF. Certain isothiazolol esters of phosphorus acids. 3,983,129, Cl. 260-302.00E.
Peters, Dale Thompson; Sandrock, Gary Dale; and Huston, Ernest Lee, to International Nickel Company, Inc., The. Cube textured nickel. 3,982,973, Cl. 148-32.000.
Peters, Gordon L.; and Saunders, William T., to National Steel Corporation. Method of increasing the corrosion resistance and improving the organic coating characteristics of cold rolled steel and the products thus prepared. 3,983,305, Cl. 428-467.000.
Peterson, Robert S., to Westinghouse Electric Corporation. Direct current motor speed control apparatus. 3,983,464, Cl. 318-327.000.
Peterson, Stanley G.: *See—*
Goossen, Charles G.; and Peterson, Stanley G., 3,983,287.
Petrokas, Leonid Venediktovich: *See—*
Badenkov, Petr Fedorovich; Portny, Gennady Lazarevich; Muslaev, Igor Mikhailovich; Pukhova, Regina Lazarevna; Roitburd, Isaak Shlemovich; Ljubartovich, Natalya Vasilievna; Rossin, Valery Donovich; Petrokas, Leonid Venediktovich; and Tsaplin, Nikolai Sergeevich, 3,982,989.
Petrolite Corporation: *See—*
Annand, Robert R.; and Woodson, Aldred E., 3,982,894.
Lissant, Kenneth J., 3,983,213.
Pettit, Maurice Raymond: *See—*
Clabburn, Robin James T.; Pettit, Maurice Raymond; and De Keermaecker, Guido, 3,982,564.
Peyser, Harry A.: *See—*
Bozek, John S.; and Peyser, Harry A., 3,982,658.
Pfaffendorf, James L.: *See—*
Krizan, Bradford J.; and Pfaffendorf, James L., 3,982,690.
Pfarrwaller, Erwin; and Nick, Kurt, to Sulzer Brothers Limited. Shuttle return apparatus. 3,982,567, Cl. 139-439.000.
Pfefferle, William C., to Engelhard Minerals & Chemicals Corporation. Furnace apparatus and method. 3,982,879, Cl. 431-10.000.
Pfeil, Christian: *See—*
Gerresheim, Jost; Drennhaus, Alfons; Breidenbach, Hans; Mansour, Rodolf; and Pfeil, Christian, 3,982,600.
Pfiffner, Albert; and Schwieter, Ulrich, to Hoffmann-La Roche Inc. Epithio compounds. 3,983,243, Cl. 424-275.000.
Pfiffner, Albert: *See—*
Chodnekar, Madhukar Subraya; Schwieter, Ulrich; Loeliger, Peter; Pfiffner, Albert; Suchy, Milos; and Zurfluh, Rene, 3,983,247.
Pfizer Inc.: *See—*
Holland, Gerald F., 3,983,107.
Philip Morris Incorporated: *See—*
de la Burde, Roger Z.; Aument, Patrick E.; Dawson, Ray F.; and Tamol, Ronald A., 3,982,550.
Phillipps, Gordon Hanley; Lawrence, Robin; and Newall, Christopher Earle, to Glaxo Laboratories Limited. Steroidal anaesthetics of the pregnane and 19-norpregnane series. 3,983,111, Cl. 260-239.500.
Phillipps, Patrick G., to Brattle Instrument Corporation. Apparatus for refining signals derived from fetal heartbeats. 3,982,528, Cl. 128-2.05T.
Phillips, Calman P. Audio-visual display device. 3,982,344, Cl. 40-106.100.
Phillips Fibers Corporation: *See—*
Saleeby, Ralph, 3,982,707.
Phillips Petroleum Company: *See—*
Childs, William V., 3,983,015.
Hitzman, Donald O.; and Wegner, Eugene H., 3,982,998.
Lortz, Russell W., 3,982,902.
Moczygemba, George A.; Johnson, W. Delmar; and Clark, Earl, 3,983,187.
Phillips, Virgel E., to General Electric Company. Method of detecting a leak in any one of the vacuum interrupters of a high voltage circuit breaker. 3,983,345, Cl. 200-144.00B.
Photo Systems, Inc.: *See—*
Mitchell, Robert W., 3,982,825.
Picas, Arturo: *See—*
Llach, Lawrence; and Picas, Arturo, 3,982,301.
Picker Corporation: *See—*
Cox, Jerome R., Jr.; and Snyder, Donald L., 3,983,399.
Martone, Ronald J.; Yarsawich, Michael; and Wolczek, Walter, 3,983,394.
Pickett, David A., to Allied Chemical Corporation. Pressure control apparatus. 3,982,562, Cl. 137-625.400.
Pickett, John E. P.; Kinney, Thomas D.; and Winders, Gene M. Two-part composite device for histologic tissue processing and embedding. 3,982,862, Cl. 425-117.000.
Piercey, Anthony C. Adjustable blind structure. 3,982,355, Cl. 49-74.000.
Pilet, Daniel: *See—*
Conroux, Jean-Jacques; Pilet, Daniel; and Roehrich, Christian, 3,982,409.
Pillsbury Company, The: *See—*
Norris, Helen R.; Niemand, Carolyn M.; and Andreas, David W., 3,983,256.
Parlour, A. Kenneth; Leezer, James R.; and Turpin, Charles H., 3,982,686.
Pillus, Charles A.: *See—*
Ku, San-Mei; Pillus, Charles A.; Poponiak, Michael R.; and Schwenker, Robert O., 3,982,967.
Pilorget, Andre. Cartridge or cartridge case ejectors for revolver cylinders. 3,982,346, Cl. 42-68.000.
Pines, Seemon, to Merck & Co., Inc. Antibiotic purification process. 3,983,108, Cl. 260-243.00C.
Pirson, Ewald: *See—*
Huber, Peter; Pirson, Ewald; and Lampelzammer, Helga, 3,983,272.
Pittner, Heribert: *See—*
Zolss, Gerhard; Pittner, Heribert; Stormann-Menninger-Lerchenthal, Heimo; and Lindner, Irmgard, 3,983,169.
Platko, Steve: *See—*
Jordan, Lester J.; and Platko, Steve, 3,983,458.
Platt, John G.; Arnold, Harmon W.; Tieman, Lloyd E.; and Isaacs, Robert O., to Flex-O-Lators, Inc. Spring assembly for upholstered seats. 3,982,737, Cl. 267-102.000.
Plempel, Manfred: *See—*
Buchel, Karl Heinz; Plempel, Manfred; and Kramer, Wolfgang, 3,983,240.
PLIVA Pharmaceutical and Chemical Works: *See—*
Kobrehel, Gabrijela; Tamburasev, Zrinka; and Djokic, Slobodan, 3,983,103.
Plyler, Robert G.: *See—*
Cope, Kenneth P.; and Plyler, Robert G., 3,982,813.
Poittevin, Andre: *See—*
Perronnet, Jacques; Taliani, Laurent; Girault, Pierre; and Poittevin, Andre, 3,983,129.
Polak, James C.; and Ross, Phillip J., to General Motors Corporation. Input-split hydromechanical transmission. 3,982,448, Cl. 74-687.000.
Polan, Alvin F.: *See—*
Malek, Hooshang; and Polan, Alvin F., 3,983,336.
Polaroid Corporation: *See—*
Chiang, Yunn H., 3,983,137.
Polhemus Navigation Sciences, Inc.: *See—*
Kuipers, Jack, 3,983,474.
Pollet, Robert Joseph; and Vandenberghe, Antoon Leon, to AGFA-GEVAERT, N.V. Fog-inhibitors for silver halide photography silver halide photographic material containing an iodo benzene compound as antifoggant. 3,982,947, Cl. 96-109.000.
Pollock, Charles W., to United States of America, Energy Research and Development Administration. Recovery of boric acid from ion exchangers. 3,983,220, Cl. 423-283.000.
Pommellet, Olivier; and Drioton, Guy, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Process and device for immobilizing a mobile component of a tire testig device relative to a fixed component thereof. 3,982,430, Cl. 73-146.000.
Ponci, Riccardo: *See—*
Arsura, Emilio; Baruffini, Agostino; Gialdi, Franco; Pellegrini, Giovanni; Ponci, Riccardo; and Scrivani, Pietro, 3,982,931.
Poponiak, Michael R.: *See—*
Ku, San-Mei; Pillus, Charles A.; Poponiak, Michael R.; and Schwenker, Robert O., 3,982,967.
Popov, Boris Vasilievich: *See—*
Krylov, Nikolai Ivanovich; Popov, Boris Vasilievich; Sidorov, Pavel Ivanovich; and Kim, Jury Efimovich, 3,982,456.
Porter, Gerald K.: *See—*
Asbelle, Charles C.; Helmuth, Gene R.; Applegate, William R.; and Porter, Gerald K., 3,982,280.
Portny, Gennady Lazarevich: *See—*
Badenkov, Petr Fedorovich; Portny, Gennady Lazarevich; Muslaev, Igor Mikhailovich; Pukhova, Regina Lazarevna; Roitburd, Isaak Shlemovich; Ljubartovich, Natalya Vasilievna; Rossin, Valery Donovich; Petrokas, Leonid Venediktovich; and Tsaplin, Nikolai Sergeevich, 3,982,989.
Porvair Limited: *See—*
Cunningham, Victor Ralph; and Boutle, David Leonard, 3,982,335.
Posti, Jouko Juhani. Auxiliary rudder for a jet propulsion unit. 3,982,494, Cl. 115-12.00R.
Powell, Jimmie L.: *See—*
Frieser, Rudolf G.; Powell, Jimmie L.; and Tummala, Rao R., 3,982,918.
Powell, Ronald Lee; and Smith, Frank Patterson, II, to Narco Scientific Industries, Inc. Digital DME with compensation for ground station intermittencies. 3,983,557, Cl. 343-7.300.
Power, George Edward; and Wulfekotter, Dudley, to Formica Corporation. Thin, tough, stable laminate. 3,983,307, Cl. 428-503.000.
Pozdneev, Viktor Timofeevich; Khina, Mikhail Lvovich; Bashkirov, Dmitry Vasilievich; Judin, Nikolai Fedorovich; and Kobzev, Nikolai Sergeevich. Coating for local protection of parts. 3,983,088, Cl. 260-24.000.
Pozsgay, Dezsoe Albert; and Scheib, William R., to Aetna-Standard Engineering Company. Indexing wedge drive for cold tube reducing mills and the like. 3,982,416, Cl. 72-214.000.
Pozzetti, Mario, to Finike Italiana Marposs-Soc. In Accomandita Semplice di Mario Possati & C. Control device for a machine tool. 3,983,376, Cl. 235-151.130.
PPG Industries, Inc.: *See—*
Ellsworth, Arthur C.; and Carlin, William W., 3,983,016.
Hoekje, Howard H.; and Dietz, Paul L., 3,982,960.

Pratt, Richard D.; Proffitt, Paul F.; and Webb, George, to General Electric Company. Intumescent fire retardant material and article. 3,983,082, Cl. 260-2.5QS.

Precision Flexmold, Inc.: *See—*
Maurino, William J.; and Putzer, Raymond M., 3,982,721.

Preu, Willi, to Scovill Manufacturing Company. Panel holding structure. 3,982,371, Cl. 52-498.000.

Price, George Edmund, to International Business Machines Corporation. Ticket information recording and web parting mechanism. 3,983,578, Cl. 360-1.000.

Printing Developments, Inc.: *See—*
Moe, William West; Lotz, Robert William; Green, Ethan Robert; and Fazio, Rodolfo, 3,983,319.

Prisc, Martin D.: *See—*
Chong, Clyde H. H.; Love, Calvin M.; Prisc, Martin D.; and Russo, Alexander J., 3,983,219.

Procter & Gamble Company, The: *See—*
Collins, Jerome H., 3,983,078.
Schaefer, Jean E., 3,982,374.
Singh, Gyanendra, 3,983,251.
Spadini, Gianfranco Luigi; and Demessemaekers, Emiel Mathilde Anna Alfons, 3,983,079.
Tofe, Andrew John; and Francis, Marion David, 3,983,227.

Produits Chimiques Pechiney-Saint Gobain: *See—*
Strini, Jean-Claude; and Correia, Yves, 3,983,181.

Produits Chimiques Ugine Kuhlmann: *See—*
Riess, Jean; Santini, Georges; and Le Blanc, Maurice, 3,983,179.

Proffitt, Paul F.: *See—*
Pratt, Richard D.; Proffitt, Paul F.; and Webb, George, 3,983,082.

Promecam Sisson-Lehmann: *See—*
Cailloux, Paul, 3,982,417.

Protzman, Thomas F.: *See—*
Blevins, Charles W.; and Protzman, Thomas F., 3,982,420.

Pruett, Vernon E. Construction deck elevation gauge and easy-out bolt assembly. 3,982,867, Cl. 425-171.000.

Pruznick, Michael D.: *See—*
Ketcham, David J.; Lowe, Roger W.; Pruznick, Michael D.; and Opittek, Eugene W., 3,983,320.

Pryde, Everett H.: *See—*
Awl, Richard A.; and Pryde, Everett H., 3,983,067.

Pryor, Michael J.: *See—*
Winter, Joseph; Setzer, William C.; Graham, Douglas L.; and Pryor, Michael J., 3,983,275.

Puchalski, Chester: *See—*
Brown, Richard E.; Puchalski, Chester; and Shavel, John, Jr., 3,983,110.

Pukhova, Regina Lazarevna: *See—*
Badenkov, Petr Fedorovich; Portny, Gennady Lazarevich; Muslaev, Igor Mikhailovich; Pukhova, Regina Lazarevna; Roitburd, Isaak Shlemovich; Ljubartovich, Natalya Vasilievna; Rossin, Valery Donovich; Petrokas, Leonid Venediktovich; and Tsaplin, Nikolai Sergeevich, 3,982,989.

Pulda, William F., to Vanguard Machinery Corporation. Method for transporting and reorienting a stack of materials. 3,982,750, Cl. 271-151.000.

Pullman Incorporated: *See—*
Miller, Roy W., 3,982,641.

Purcell, Robert J.; Balzer, David J.; and Van Zandt, Rollin P., to Caterpillar Tractor Co. Multidirectional resilient suspension for vehicles. 3,982,598, Cl. 180-9.540.

Purdue Research Foundation: *See—*
Newhouse, Vernon L.; and Cooper, George R., 3,982,426.
Regnier, Frederick E., 3,983,299.

Pursell, Lynne Margaret: *See—*
Parsons, Brian Jeremy; and Pursell, Lynne Margaret, 3,983,537.

Purvis, Marshall T.; and Grant, R. Peter, to Rohm and Haas Company. Modifiers for PVC foam, process for extruding modified PVC foam and modified PVC foam compositions. 3,983,296, Cl. 428-315.000.

Putzer, Raymond M.: *See—*
Maurino, William J.; and Putzer, Raymond M., 3,982,721.

Pyles, Wayne Douglas: *See—*
Wentz, Edward A.; and Pyles, Wayne Douglas, 3,982,625.

Quantel Limited: *See—*
Stalley, Anthony Donald, 3,983,410.

Quick, Leonard M.: *See—*
McCollum, John D.; and Quick, Leonard M., 3,983,027.
McCollum, John D.; and Quick, Leonard M., 3,983,028.

R. A. Pearson Company: *See—*
Graham, Robert H., 3,982,662.

R. Stahl Aufzuege GmbH: *See—*
Feyrer, Klaus; and Mueller, Wolfgang P., 3,982,692.

Rabenhorst, David W., to Johns Hopkins University, The. Convoluted rotor structures. 3,982,447, Cl. 74-572.000.

Rademachers, Jakob; Woditsch, Peter; Erfurth, Henning; Holle, Bernd; and Schnell, Wilhelm, to Bayer Aktiengesellschaft. Production of basic aluminium nitrate solution. 3,983,221, Cl. 423-395.000.

Radiant Technology Corporation: *See—*
Wild, Fred A.; Romance, Joseph S.; and Richert, Carson T., 3,983,361.

Rae, Giles E.: *See—*
Danzer, Paul M.; and Rae, Giles E., 3,983,556.

Raeymaekers, Alfons Herman Margaretha: *See—*
Van Gelder, Josephus Ludovicus Hubertus; Raeymaekers, Alfons Herman Margaretha; Roevens, Leopold Frans Corneel; and Van Laerhoven, Willy Joannes, 3,983,133.

Rajala, Ronald G.: *See—*
Berry, Thomas F.; Rajala, Ronald G.; and Mullins, Harold L., 3,982,854.

Rakowsky, Edward L.; and Marchese, Vincent P., to United States of America, Army. Flueric through bulkhead rocket motor ignitor. 3,982,488, Cl. 102-81.000.

Ralston, Richard W., Jr., to Olin Corporation. Apparatus for regulating anode-cathode spacing in an electrolytic cell. 3,983,025, Cl. 204-225.000.

Rambauske, Werner R., to Raytheon Company. Catoptric lens arrangement. 3,982,824, Cl. 350-294.000.

Rank Xerox Ltd.: *See—*
Bendall, Dennis M.; and Thorp, Peter M., 3,982,832.

Rankin, Alexander. Brush holder assembly. 3,983,432, Cl. 310-242.000.

Ransomes Sims & Jefferies Limited: *See—*
Gaskin, Graham Edward, 3,982,646.

Rasmussen, Chris Royce, to McNeil Laboratories, Incorporated. 4-Oxo-2-imidazolidinylidene ureas. 3,983,135, Cl. 260-309.700.

Rasmussen, Gunnar Olaf Vestergaard. Convector for heating buildings and tools and method for manufacturing convector modules for such convectors. 3,982,311, Cl. 29-33.00G.

Rasor, Ned S.; and Britt, Edward J., to United States of America, Energy Research and Development Administration. Thermionic converter. 3,983,423, Cl. 310-4.00R.

Rasselstein Aktiengesellschaft: *See—*
Billigmann, Joseph; Schneider, Christoph; Siewert, Johannes; and Sodeik, Manfred, 3,982,968.

Rauch, Konrad; Kiefer, Hans; Hesse, Dieter; Strohmeyer, Max; and Hohenschutz, Heinz, to BASF Aktiengesellschaft. Recovery of the formic acid/water azeotrope by distillation. 3,983,010, Cl. 203-15.000.

Raychem Corporation: *See—*
Clabburn, Robin James T.; Pettit, Maurice Raymond; and De Keermaecker, Guido, 3,982,564.
Penneck, Richard John, 3,983,070.

Raymond Lee Organization, Inc., The: *See—*
Claypool, Dallas D., 3,982,675.
Johnson, Leo D., 3,982,292.
Meyer, Ruth, 3,982,305.
Sarich, John I., 3,982,755.
Yogore, Mario G., 3,983,421.

Raymond, William R., to Hoffman, Theodore S. Alarm system for coin-operated telephone. 3,983,551, Cl. 340-276.000.

Raytheon Company: *See—*
Rambauske, Werner R., 3,982,824.
Statz, Hermann; and Feist, Wolfgang M., 3,983,574.

RCA Corporation: *See—*
Arnold, Anthony Francis, 3,982,908.
Bazin, Lucas John, 3,983,452.
Miller, Michael Evans; and Amery, John Gordon, 3,983,318.
Russo, Paul Michael, 3,983,571.
Schade, Horst Ernst Paul, 3,983,443.
Schopp, James Conrad, 3,983,316.
Shanley, Robert Loren, II; and Yongue, James McIntire, 3,983,576.
Wheatley, Carl Franklin, Jr., 3,983,502.

Read, Eileen: *See—*
Mitchell, Richard Frank; Read, Eileen; and Stevens, Richard, 3,983,515.

Reading Alloys, Inc.: *See—*
Perfect, Frederick H., 3,982,924.

Reed, David F., to Borg-Warner Corporation. Constant speed drive. 3,982,615, Cl. 192-103.00F.

Reed, Gordon Howard; and Yates, Michael Anthony, to Television Research Limited. Tape readers. 3,983,365, Cl. 235-61.11A.

Reedy, James Dale; and Furbee, Harold D., to Union Carbide Corporation. Process for producing cyclic siloxanes. 3,983,148, Cl. 260-448.20E.

Regh, Joseph: *See—*
Edel, William A.; and Regh, Joseph, 3,982,974.

Regie Nationale des Usines Renault: *See—*
Pommellet, Olivier; and Drioton, Guy, 3,982,430.
Rivere, Jean-Pierre, 3,982,505.

Regnier, Frederick E., to Purdue Research Foundation. Bonded carbohydrate stationary phases for chromatography. 3,983,299, Cl. 428-405.000.

Reichel, Fritz: *See—*
Scharf, Emil; Naarmann, Herbert; and Reichel, Fritz, 3,983,268.

Reifenscheid, Bernhard: *See—*
Deutsch, Ernst; and Reifenscheid, Bernhard, 3,982,361.

Reinhard, Donald L.: *See—*
Abolins, Visvaldis; and Reinhard, Donald L., 3,983,090.

Reinke, Ronald E.: *See—*
Aubel, John A.; and Reinke, Ronald E., 3,982,555.

Reliance Electric Company: *See—*
Bublitz, Arthur T.; and Holben, Eugene F., 3,982,726.

Relyveld, Edgar Hans, to Agence Nationale de Valorisation de la Recherche (ANVAR). Vaccines, the process for preparing the same and the applications thereof. 3,983,229, Cl. 424-92.000.

Rema Electronic Ltd.: *See—*
Dahlstrom, Claes; Bang, Borje; and Tannerstal, Harding, 3,983,403.

Remington Arms Company, Inc.: *See—*
Kenney, Joseph F., 3,983,149.

Whitney, Paul V., Jr.; Bolen, Robert J.; and Cotter, William W., Jr., 3,983,357.

Replin, Henry, to Vector Wheel Corporation. Tire structure and method. 3,982,576, Cl. 152-155.000.

Republic Electronic Industries, Inc.: *See—*
Biagi, Alvaro D.; Silbiger, Richard; and Orloff, Leslie, 3,983,561.

Research Corporation: *See—*
Tang, Chung-Liang; and Telle, John M., 3,983,507.

Resop, W. Paul: *See—*
Hersey, Carl; and Resop, W. Paul, 3,982,756.

Reth, Erich; Varwig, Karl-Heinz; and Backhaus, Karl-Heinz, to Demag Aktiengesellschaft. Apparatus for slowing head pieces and samples coming from a rolling mill. 3,982,439, Cl. 73-423.00R.

Retrum, Fergus. Returnable mailing envelope. 3,982,689, Cl. 229-71.000.

Rettinger, Lawrence John, Jr.; and Balliet, Layton, to International Business Machines Corporation. Acquisition process in a phase-locked-loop by gated means. 3,983,506, Cl. 331-17.000.

Reymond, Edgard. Half-tone screen making by decapitation of substrate projections. 3,982,949, Cl. 96-116.000.

Reynolds, Orr E. Apparatus and process for mechanical power production by acetylene combustion. 3,982,391, Cl. 60-39.020.

Rheinfelder, William A., to Alpha Engineering Corporation. RF level sensing circuit. 3,983,417, Cl. 307-261.000.

Rheinfelder, William A., to Alpha Engineering Corporation. Modular CATV system. 3,983,486, Cl. 325-308.000.

Rheinische Chamotte und Dinas-Werke: *See—*
Eisenbach, Kurt, 3,982,876.

Rhiem, Hans-Christoph: *See—*
Ney, Robert; and Rhiem, Hans-Christoph, 3,983,313.

Rhodes, Richard O.: *See—*
Ford, Freeman A.; and Rhodes, Richard O., 3,982,723.

Rhone-Poulenc Industries: *See—*
Balme, Maurice; and Gruffaz, Max, 3,983,100.

Rhone-Poulenc S.A.: *See—*
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Letoffe, Michel, 3,983,265.

Rhone-Poulenc-Textile: *See—*
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Isoard, Bernard; and Juppet, Paul, 3,982,412.

Riat, Henri: *See—*
Seitz, Karl; Begrich, Rainer; Riat, Henri; and Oesterlein, Fritz, 3,983,115.

Riboulet, Robert; and Charvet, Eugene, to La Cellophane. Composite polyester films and process for producing the same. 3,983,285, Cl. 428-212.000.

Riccio, Pasquale R., to Ciba-Geigy Corporation. Aerosol dispenser for plurality of fluent materials. 3,982,668, Cl. 222-95.000.

Richardson, John L.; Segovia, Gilbert; and Lewis, Clarke H., to Oxy Metal Industries Corporation. Process for manufacturing a helical reverse osmosis segment. 3,983,194, Cl. 264-41.000.

Richardson-Merrell Inc.: *See—*
Albrecht, William L.; Horgan, Stephen W.; Sill, Arthur D.; and Fleming, Robert W., 3,983,124.
Grisar, Johann M.; Sill, Arthur D.; and Fleming, Robert W., 3,983,248.
Lundberg, Charles Andrew, 3,983,122.

Richelle, Adelin F.; and Harnau, Hans D., to S.A. Prb. Societe Anonyme. Micro-delayed detonator for ballistic rockets and rockets thus equipped. 3,982,487, Cl. 102-70.00R.

Richert, Carson T.: *See—*
Wild, Fred A.; Romance, Joseph S.; and Richert, Carson T., 3,983,361.

Richnak, Paul J.: *See—*
Graves, Charles Berger; Richnak, Paul J.; Wilkinson, Robert M.; and Wright, Robert G., 3,982,681.

Richter, Sidney B.; and Krenzer, John, to Velsicol Chemical Corporation. Dialkyl acetals of N-α-halocetylanilino aldehydes. 3,983,174, Cl. 260-562.00B.

Richter, Sidney B.: *See—*
Krenzer, John; and Richter, Sidney B., 3,982,922.

Ridders, Johannes Antonius Maria: *See—*
Blommerde, Cornelis Wilhelmus Adrianus; Ridders, Johannes Antonius Maria; and Westerbeke, Huibregt, 3,983,439.

Riesgraf, Mathias H.: *See—*
Stone, Richard A.; and Riesgraf, Mathias H., 3,982,413.

Riess, Jean; Santini, Georges; and Le Blanc, Maurice, to Produits Chimiques Ugine Kuhlmann. 1,2,3,4 Tetrakis-(perfluoroalkyl)-1,3-butadienes. 3,983,179, Cl. 260-653.300.

Riha, Miloslav; Martinec, Josef; and Cernocky, Jiri, to Zbrojovka Vsetin, narodni podnik. Device for gripping and forming a supply of weft thread before weft insertion. 3,982,568, Cl. 139-452.000.

Rinker, William Richard, to B. F. Goodrich Company, The. Continuous mold thermo forming. 3,982,868, Cl. 425-223.000.

Risley, Hugh A.: *See—*
Goodhue, Charles T.; Risley, Hugh A.; Snoke, Roy E.; and Underwood, Gary M., 3,983,005.

Rittenbach, Otto E., to United States of America, Army. Moving target indicating (MTI) radar systems employing vehicle discriminator apparatus. 3,983,558, Cl. 343-7.700.

Rivere, Jean-Pierre, to Regie Nationale des Usines Renault. Circuitry for controlling the response time of electromagnetic devices with a solenoid. 3,982,505, Cl. 123-32.0EA.

Rixon Inc.: *See—*
Stuart, Richard L., 3,983,485.

Robbins, David. Disposable sink strainer. 3,982,289, Cl. 4-292.000.

Robbins, Elmer A.; and Key, William D., to Tokheim Corporation. Batch controller for gasoline having dribble feed. 3,982,664, Cl. 222-21.000.

Robert Bosch G.m.b.H.: *See—*
Aldinger, Ulrich, deceased; Aldinger, Ruth, heir; and Aldinger, Karl, heir, 3,982,855.

Roberts, Gregory; and Badertscher, Roger, to Fairchild Camera and Instrument Corporation. Differential sense amplifier. 3,983,412, Cl. 307-235.00F.

Roberts, John, IV, to American Paper Products Company. Envelope-making method. 3,982,473, Cl. 93-63.00M.

Roberts, R. Douglas, Jr. Combined grab bar and shower head fixture. 3,982,285, Cl. 4-145.000.

Robertshaw Controls Company: *See—*
Bauer, Werner R., 3,983,351.

Robinair Manufacturing Corporation: *See—*
Cain, Robert L., 3,982,864.

Robinson, Graham: *See—*
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Robinson, John A.: *See—*
Sorensen, Andrew J., III; and Robinson, John A., 3,983,374.

ROC A.G.: *See—*
Elbel, Karl; and Wolfinger, Kurt, 3,982,359.

Rock, Michael H., to Bendix Corporation, The. Fail safe logic monitor. 3,983,329, Cl. 179-15.0BF.

Rockstad, Howard K.; and Flasck, Richard A., to Energy Conversion Devices, Inc. N-type amorphous semiconductor materials. 3,983,076, Cl. 252-518.000.

Rockwell International Corporation: *See—*
Johnson, Robert A., 3,983,516.
Licari, James J.; and Willing, Robert, 3,983,270.
McLain, Robert E., 3,982,425.
Siu, Bernard K.; and Allemang, Richard D., 3,982,811.

Rodgers, Gerald L.: *See—*
Seigler, Jack D.; and Rodgers, Gerald L., 3,982,405.

Rodgers, James L., to Talos Systems, Inc. Method and apparatus for converting the location and movement of a manually controlled instrument into corresponding electrical signals. 3,983,322, Cl. 178-19.000.

Roeder, Richard L.: *See—*
Auer, Mary L.; and Roeder, Richard L., 3,982,687.

Roehrich, Christian: *See—*
Conroux, Jean-Jacques; Pilet, Daniel; and Roehrich, Christian, 3,982,409.

Roetgerink, Johannes Antonius, to Machinefabriek M. Brouwer & Co. B.V. Device for directed discharge of conical articles. 3,982,637, Cl. 214-6.00D.

Roevens, Leopold Frans Corneel: *See—*
Van Gelder, Josephus Ludovicus Hubertus; Raeymaekers, Alfons Herman Margaretha; Roevens, Leopold Frans Corneel; and Van Laerhoven, Willy Joannes, 3,983,133.

Rogers, Charles H.: *See—*
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Rogora, Edgardo: *See—*
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Rohm and Haas Company: *See—*
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Rohweder, Glen Willard; and Hengen, Edward John, to Deere & Company. Row crop harvesting header. 3,982,384, Cl. 56-106.000.

Roitburd, Isaak Shlemovich: *See—*
Badenkov, Petr Fedorovich; Portny, Gennady Lazarevich; Muslaev, Igor Mikhailovich; Pukhova, Regina Lazarevna; Roitburd, Isaak Shlemovich; Ljubartovich, Natalya Vasilievna; Rossin, Valery Donovich; Petrokas, Leonid Venediktovich; and Tsaplin, Nikolai Sergeevich, 3,982,989.

Rolls-Royce (1971) Limited: *See—*
Jenkinson, John, 3,982,850.

Romance, Joseph S.: *See—*
Wild, Fred A.; Romance, Joseph S.; and Richert, Carson T., 3,983,361.

Rookey, Earl T., to Northrop Corporation. Fuel degassing method. 3,982,399, Cl. 60-706.000.

Roosa, Vernon D. Tank flushing means. 3,982,556, Cl. 137-432.000.

Rose, Leslie C.: *See—*
Hamrick, Joseph T.; and Rose, Leslie C., 3,982,591.
Hamrick, Joseph T.; and Rose, Leslie C., 3,982,592.

Ross, John R. Gastrointestinal aspirator pump system and method. 3,982,540, Cl. 128-278.000.

Ross, Phillip J.: *See—*
Polak, James C.; and Ross, Phillip J., 3,982,448.

Ross, Richard T., to Scott Paper Company. Bulk package for substantially wet sheets and dispensing device therefor. 3,982,659, Cl. 221-63.000.

Ross, Stephen T.: *See—*
Ladd, David L.; and Ross, Stephen T., 3,983,245.

Rossin, Valery Donovich: *See—*
Badenkov, Petr Fedorovich; Portny, Gennady Lazarevich; Muslaev, Igor Mikhailovich; Pukhova, Regina Lazarevna; Roitburd, Isaak Shlemovich; Ljubartovich, Natalya Vasilievna; Rossin, Valery Donovich; Petrokas, Leonid Venediktovich; and Tsaplin, Nikolai Sergeevich, 3,982,989.

Rosynek, Michael P.; Shipman, George F.; and Yan, Tsoung-Yuan, to Mobil Oil Corporation. Combination process for residua demetalation, desulfurization and resulting coke gasification. 3,983,030, Cl. 208-253.000.

Rounds, Hugh G.: *See—*
Schoenrock, Kantheinz W. R.; Gupta, Avinash; and Rounds, Hugh G., 3,982,956.

Roussel-UCLAF: *See—*
Perronnet, Jacques; Taliani, Laurent; Girault, Pierre; and Poittevin, Andre, 3,983,129.

Rouverol, William S. Constant tooth-load gearing. 3,982,444, Cl. 74-462.000.

Rouverol, William S. High torque gearing. 3,982,445, Cl. 74-462.000.

Rubber Dynamics Corporation: *See—*
Jones, Walter C., 3,982,573.

Ruble, Theodore A., to Sid Richardson Carbon & Gasoline Co. Method and apparatus for controlling surface temperature. 3,982,586, Cl. 165-107.000.

Rudolph, Gunther; Schelzke, Erhard; and Leogrande, Antonio, to Vereinigte Deutsche Metallwerke AG. Brass alloy. 3,982,933, Cl. 75-156.500.

Ruge, Donald Henry: *See—*
Sieverin, Walter Joseph; and Ruge, Donald Henry, 3,982,619.

Russell, Charles R.: *See—*
Fellwock, Charles G.; and Russell, Charles R., 3,982,798.

Russell, David S., to Columbine Glass Company, Inc. Article control system. 3,983,373, Cl. 235-151.300.

Russo, Alexander J.: *See—*
Chong, Clyde H. H.; Love, Calvin M.; Prise, Martin D.; and Russo, Alexander J., 3,983,219.

Russo, Doris A. Hair brush and comb cleaning apparatus. 3,982,296, Cl. 15-38.000.

Russo, Paul Michael, to RCA Corporation. Electronic image identifying system. 3,983,571, Cl. 354-105.000.

Rusznyak, Andreas: *See—*
Luscher, Jakob; and Rusznyak, Andreas, 3,983,411.

Ryan, James Ernest; and Smale, Rodney, to Imperial Chemical Industries Limited. Method of forming panels. 3,982,985, Cl. 156-303.100.

Rzewuski, Michael Napoleon: *See—*
Stuchly, Stanislaw Szczesny; Rzewuski, Michael Napoleon; and Tarnawecky, Michael Zenon, 3,983,477.

S. C. Johnson & Son, Inc.: *See—*
Dill, Douglas W., 3,983,060.

Saari, Walfred S., to Merck & Co., Inc. Amino acid esters. 3,983,138, Cl. 260-326.430.

Safiuddin, Mohammed, to Westinghouse Electric Corporation. Motor field control for d.c. drives. 3,983,466, Cl. 318-338.000.

Saile, Karl: *See—*
Brandl, Rudolf; Moller, Tilo; Saile, Karl; and Streckfuss, Heinrich, 3,982,347.

Saito, Fumio, to Nihon Beru-Haueru Kabushiki Kaisha (Bell & Howell Japan, Ltd.). Cine camera. 3,982,826, Cl. 352-14.000.

Saito, Masaaki: *See—*
Masaki, Kenji; and Saito, Masaaki, 3,982,393.

Saito, Shinji; and Suzuki, Masao, to Tekyo Keiki Company Limited. Electromagnetic flapper valve. 3,982,554, Cl. 137-82.000.

Saito, Takashi: *See—*
Nishizaki, Syunichiro; Teratani, Hiroshi; Fujisawa, Osamu; Fukushima, Jiro; Tokizawa, Makoto; Wakabayashi, Nobukatsu; and Saito, Takashi, 3,983,289.

Saito, Toranosuke; and Tanaka, Daiichiro, to Sanko Chemical Company Ltd. Pressure sensitive recording papers. 3,983,292, Cl. 428-306.000.

Sakai, Kiyoshi: *See—*
Oda, Osamu; Sakai, Kiyoshi; Yusa, Takashi; and Katano, Hamako, 3,983,152.

Sakal, John: *See—*
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Sakamoto, Kazutami: *See—*
Yoshida, Ryonosuke; and Sakamoto, Kazutami, 3,983,085.

Sakanoue, Seiki: *See—*
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Sakashita, Noriji: *See—*
Obayashi, Nobuharu; Hashizume, Hikaru; Sakashita, Noriji; Kameyama, Seiji; Ezawa, Sadaaki; Kugisawa, Toshio; Washiyama, Yutaka; Kondo, Tatsunori; and Watanabe, Hironori, 3,982,460.

Sakata, Denjiro. Solenoid electromagnet having a wide, controlled stroke. 3,983,520, Cl. 335-170.000.

Salamon, Zoltan: *See—*
Meszaros, Lajos; Grega, Jozsef; Lako, Lajos; Marko, Laszlo; Salamon, Zoltan; Szatmari, Istvan; and Tasi, Laszlo, 3,982,736.

Saleeby, Ralph, to Phillips Fibers Corporation. Method and apparatus for the production of two packages of yarn with transfer tails. 3,982,707, Cl. 242-18.0PW.

Saleil, Jean, to Creusot-Loire. Method of blowing to obtain a very low amount of carbon in chrome steels. 3,982,927, Cl. 75-60.000.

Salk Institute for Biological Studies, The: *See—*
Byrd, William J., 3,982,438.

Saltsman, Robert D.; and Harris, Robert D., to Bituminous Coal Research, Inc. Method and apparatus for simulating in a model the disbursement of gas and dust in a mine. 3,982,330, Cl. 35-13.000.

Samaranch, Jorge Capella: *See—*
Valenti, Mario Capella; and Samaranch, Jorge Capella, 3,982,279.

Samour, Carlos M., to Kendall Company, The. Monomeric emulsion stabilizers. 3,983,166, Cl. 260-481.00R.

Sand, Leonard B.: *See—*
Keisling, Charles A.; and Sand, Leonard B., 3,982,896.

Sanders Associates, Inc.: *See—*
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Sanderson, Albert E., to Inventronics, Inc. Series direct-current voltage regulator. 3,983,473, Cl. 323-22.00R.

Sandoz, Inc.: *See—*
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Sandoz Ltd.: *See—*
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Sandrock, Gary Dale: *See—*
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Sanford, Steven Douglas: *See—*
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Sanko Chemical Company Ltd.: *See—*
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Sankyo Company Limited: *See—*
Endo, Akira; Kuroda, Masao; Terahara, Akira; Tsujita, Yoshio; and Tamura, Chihiro, 3,983,140.
Morisawa, Yasuhiro; Kataoka, Mitsuru; Watanabe, Taiichiro; Kitano, Noritoshi; and Matsuzawa, Toshiaki, 3,983,238.
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Sano, Hiroshi: *See—*
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Santa Fe International Corporation: *See—*
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Santini, Georges: *See—*
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Sarich, John I., to Raymond Lee Organization, Inc., The, a part interest. Weight type exercising device. 3,982,755, Cl. 272-117.000.

Sasaguri, Kilchiro: *See—*
Kikuzawa, Kenji; Sasaguri, Kilchiro; Oda, Yasuyoshi; Sano, Hiroshi; and Okina, Katsumi, 3,983,184.

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Sato, Akira: *See—*
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Sato, Haruhiko; Ishikawa, Hidehiko; and Mogaki, Katsuo, to Konishiroku Photo Co. Ltd. Process for preparing silver halide emulsion containing a rhodium salt and a decomposition product of nucleic acid. 3,982,948, Cl. 96-109.000.

Sato, Takuya R. Bioelectrodes. 3,982,529, Cl. 2.06 E.

Satoh, Masaaki: *See—*
Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; Satoh, Masaaki; Ohba, Katsuhiro; Nakamura, Shinji; Sawada, Tatsuo; Ohsaki, Nobuhide; Itoh, Yasuo; Suda, Nobuaki; Okabe, Yasuhisa; and Ozaki, Hideaki, 3,983,500.

Satoh, Takao; and Horino, Kazutaka, to Yamaha, Hatsudoki Kabushiki Kaisha. Bicycle suspension. 3,982,770, Cl. 280-284.000.

Satomi, Kunio: *See—*
Nakazawa, Mitsunobu; Araki, Yoshiaki; Haruta, Masahiro; and Satomi, Kunio, 3,983,564.

Satomi, Takeo; Mukai, Kunio; Mine, Akihiko; Hino, Naganori; Tateishi, Kohshi; and Hirano, Masachika, to Sumitomo Chemical Company, Limited. Organo phosphorus herbicides. 3,982,921, Cl. 71-87.000.

Satterwhite, Charles R., to Unit Rig and Equipment Co. Two wheel excavating and loading system. 3,982,340, Cl. 37-190.000.

Satterwhite, Charles R., to Unit Rig and Equipment Co. Transverse oscillation for excavating and loading system. 3,982,341, Cl. 37-190.000.

Satya, Akella V. S.: *See—*
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Saunders, William T.: *See—*
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Sawada, Tatsuo: *See—*
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Sayers, Anthony Campbell, to Sandoz Ltd. Treatment of dyskinesias. 3,983,234, Cl. 424-250.000.

Scapardine, James D., to Lawrence Peska Associates, Inc., a part interest. Multiple contact periodic switch having flexible radially extending contacts connected to ignition coil windings. 3,983,342, Cl. 200-26.000.

Scaringella nee Desnoyer, Monique: *See—*
Botter nee Bergheaud, Fernande; Scaringella nee Desnoyer, Monique; and Wacongne, Michel, 3,983,019.

Schabauer, Fritz M. Cartridge case decapping tool. 3,982,465, Cl. 86-36.000.

Schade, Horst Ernst Paul, to RCA Corporation. Vacuum electron device having directly-heated matrix-cathode-heater assembly. 3,983,443, Cl. 313-341.000.

Schaefer, Jean E., to Procter & Gamble Company, The. Apparatus and method for continuously forming and filling tampon sacks. 3,982,374, Cl. 53-28.000.

Schaefer, Richard A.: *See*—
Goszyk, Kurt A.; and Schaefer, Richard A., 3,983,533.

Schafer, Fritz Peter, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Electric arc discharge lamp. 3,983,436, Cl. 313-35.000.

Schallenkammer, Fred. Swing arm lamp. 3,983,386, Cl. 240-81.00R.

Schaller, Helmut F. K. Stringed instrument machine head. 3,982,462, Cl. 84-306.000.

Schaller, Rudolf: *See*—
Kaiserswerth, Hans-Peter; Wimmer, Josef; and Schaller, Rudolf, 3,982,814.

Scharf, Emil; Naarmann, Herbert; and Reichel, Fritz, to BASF Aktiengesellschaft. Process for surface sizing paper. 3,983,268, Cl. 427-341.000.

Schauls, James J., to Trane Company, The. Brazed plate-type heat exchanger for nonadiabatic rectification. 3,983,191, Cl. 261-114.00R.

Scheib, William R.: *See*—
Pozsgay, Dezsoe Albert; and Scheib, William R., 3,982,416.

Scheiffele, Helmut, to Hahn & Kolb. Tool clamping devices. 3,982,452, Cl. 82-36.00R.

Scheinberg, Israel Herbert. Filter and detector and methods of using same in the removal and detection of carbon monoxide from, and in, a gas stream. 3,982,897, Cl. 23-232.00R.

Schelzke, Erhard: *See*—
Rudolph, Gunther; Schelzke, Erhard; and Leogrande, Antonio, 3,982,933.

Scherer, Werner, to Maschinenfabrik Fahr Aktiengesellschaft. Apparatus for turning compost silo. 3,982,772, Cl. 280-462.000.

Schering Aktiengesellschaft: *See*—
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Scheuermann, Horst; and Mach, Wolfgang, to BASF Aktiengesellschaft. 6-Triazinylaminobenzofurans. 3,983,117, Cl. 260-249.800.

Schiessl, Henry W.; Kaufman, John D.; and Csejka, David A., to Olin Corporation. Composition for accelerating oxygen removal comprised of a mixture of aqueous hydrazine and an aryl amine compound. 3,983,048, Cl. 252-178.000.

Schindler, Georg: *See*—
Frenken, Hans; Schindler, Georg; and Friedsam, Josef, 3,982,665.

Schlatter, James M., to G. D. Searle & Co. Optical resolution of alkyl esters of DL-phenylalanine. 3,983,162, Cl. 260-471.00A.

Schlecht, Karl. Support means for movable connector in concrete pump arrangement. 3,982,857, Cl. 417-519.000.

Schlurensauer, Ludwig, to Lawrence Peska Associates, Inc., a part interest. Chance controlled cross-out apparatus. 3,982,763, Cl. 273-135.00D.

Schlutz, Charles A. Centrifuge separation and washing device and method. 3,982,691, Cl. 233-2.000.

Schmidt, Ludwig: *See*—
Mansmann, Manfred; and Schmidt, Ludwig, 3,982,955.

Schmitt, Edward Emil; and Epstein, Martin, to American Cyanamid Company. Reducing capillarity of polyglycolic acid sutures. 3,982,543, Cl. 128-335.500.

Schmitt, Edward Emil, to Alza Corporation. Method for treating burns. 3,983,209, Cl. 424-78.000.

Schneider, Christoph: *See*—
Billigmann, Joseph; Schneider, Christoph; Siewert, Johannes; and Sodeik, Manfred, 3,982,968.

Schneider, Franz; and Braitinger, Helmut, to L. Schuler GmbH. Apparatus for the control and regulation of cutting interval and synchronism at a cutting mechanism for the machining of strip material. 3,982,454, Cl. 83-74.000.

Schneider, William P., to Upjohn Company, The. Racemic fluoro-substituted PGE_2 analogs. 3,983,153, Cl. 260-468.00D.

Schneider, William P., to Upjohn Company, The. Racemic prostaglandins of the 2-series and analogs thereof. 3,983,154, Cl. 260-468.00D.

Schneider, William P., to Upjohn Company, The. Racemic prostaglandins of the 2-series and analogs thereof. 3,983,155, Cl. 260-468.00D.

Schnell, Wilhelm: *See*—
Rademachers, Jakob; Woditsch, Peter; Erfurth, Henning; Holle, Bernd; and Schnell, Wilhelm, 3,983,221.

Schniers, Robert C.; and Van Ostrom, David L., to General Motors Corporation. Throttle motion control device. 3,982,511, Cl. 123-103.00E.

Schoberle, Robert: *See*—
Cabaraux, Emile; and Schoberle, Robert, 3,983,026.

Schoenrock, Karlheinz W. R.; Gupta, Avinash; and Rounds, Hugh G., to Amalgamated Sugar Company, The. Process for the purification of impure sugar juice. 3,982,956, Cl. 127-46.00A.

Schoer, Heinz: *See*—
Kendziora, Heinz; Nenner, Johannes; Schoer, Heinz; and Schultze, Werner, 3,982,887.

Schonwald, Siegfried; and Obert, Peter, to Siemens Aktiengesellschaft. Side channel ring compressor including a channel break decompression nozzle. 3,982,848, Cl. 415-53.00T.

Schopp, James Conrad, to RCA Corporation. Turntable speed control system. 3,983,316, Cl. 178-6.60P.

Schrinner, Elmar: *See*—
Hartung, Herbert; Durckheimer, Walter; Schrinner, Elmar; and Gerhards, Hermann, 3,983,173.

Schrock, Wilfried: *See*—
Konig, Hans-Bodo; Schrock, Wilfried; and Metzger, Karl Georg, 3,983,105.

Schroen, Walter H.; Padovani, Francois A.; and Hentzschel, Hanspeter P. K., to Texas Instruments Incorporated. Metal-semiconductor ohmic contacts and methods of fabrication. 3,983,264, Cl. 427-39.000.

Schultze, Hartmut: *See*—
Vogtlin, Karl; Zimmermann, Hans; and Schultze, Hartmut, 3,983,566.

Schultze, Werner: *See*—
Kendziora, Heinz; Nenner, Johannes; Schoer, Heinz; and Schultze, Werner, 3,982,887.

Schuster, Samuel R., to Ovutime, Inc. Mucus testing processes and devices. 3,982,423, Cl. 73-54.000.

Schwartz, Morton. Apparatus for positioning an article on a wall. 3,982,839, Cl. 356-250.000.

Schwartz, Robert E.; and Noble, Roger K., to John Zink Company. Invisible flare burner. 3,982,881, Cl. 431-202.000.

Schwartz, Willis T., Jr.: *See*—
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Schwartztol, Robert Ira: *See*—
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Schwenker, Robert O.: *See*—
Ku, San-Mei; Pillus, Charles A.; Poponiak, Michael R.; and Schwenker, Robert O., 3,982,967.

Schwieter, Ulrich: *See*—
Chodnekar, Madhukar Subraya; Schwieter, Ulrich; Loeliger, Peter; Pfiffner, Albert; Suchy, Milos; and Zurfluh, Rene, 3,983,247.
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Schwomma, Otto, to Vockenhuber, Karl; and Hauser, Raimund. Interferometric system. 3,982,835, Cl. 356-106.00R.

Sci-Tex Corporation Ltd.: *See*—
Caspi, Amiram; and Kahn, Michael N., 3,983,370.

Science Union et Cie Societe Francaise de Recherche Medical: *See*—
Ehrreich, Stewart J.; and Zitowitz, Lester, 3,983,249.

Scifres, Donald R.; and Burnham, Robert D., to Xerox Corporation. Distributed feedback diode laser. 3,983,509, Cl. 331-94.50H.

Scimeca, Frank M., to Mr. Tuffy Co. Tube guard. 3,982,577, Cl. 152-204.000.

Scionics Corporation, The: *See*—
Newman, Frederick S.; Hartman, John T.; and Dedona, Francis A., 3,983,014.

Scott, Kenneth; and Vause, Arthur Samuel, to Thorn Electrical Industries Limited. Discharge lamp component. 3,983,440, Cl. 313-217.000.

Scott Paper Company: *See*—
Ross, Richard T., 3,982,659.
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Scott, Paul B.: *See*—
Levatter, Jeffrey I.; Lin, Shao-Chi; and Scott, Paul B., 3,983,438.

Scott, Paul F., to General Electric Company. Random sample statistical function analyzer. 3,983,379, Cl. 235-152.000.

Scovill Manufacturing Company: *See*—
Preu, Willi, 3,982,371.

Scrivani, Pietro: *See*—
Arsura, Emilio; Baruffini, Agostino; Gialdi, Franco; Pellegrini, Giovanni; Ponci, Riccardo, and Scrivani, Pietro, 3,982,931.

Sebag, Henri: *See*—
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Seemann, William H., III. Fabric constructions useful as building bases in forming compound-curved structures. 3,983,282, Cl. 428-114.000.

Segalini, Angelo, to Montedison S.p.A. Polymerization process under pressure in an annular equipment. 3,983,096, Cl. 526-64.000.

Segovia, Gilbert: *See*—
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Sehgal, Surendra N.; Singh, Kartar; and Vezina, Claude, to Ayerst McKenna and Harrison Ltd. Antibiotic substances and preparation. 3,983,231, Cl. 424-118.000.

Seigler, Jack D.; and Rodgers, Gerald L. Hazardous duty room air conditioner. 3,982,405, Cl. 62-181.000.

Seitz, Karl; Begrich, Rainer; Riat, Henri; and Oesterlein, Fritz, to Ciba-Geigy Corporation. Bis-dihalogeno-s-triazinyl ureas. 3,983,115, Cl. 260-249.500.

Sekhon, Jagdish S., to Hi-Shear Corporation. Fastener with protective metal-organic base coating. 3,983,304, Cl. 428-460.000.

Sekizawa, Shine, to Tokyo Iryoki Kabushiki Kaisha. Readily zeroed pressure gage of sphygmomanometer. 3,982,437, Cl. 73-410.000.

Sekmakas, Kazys, to DeSoto, Inc. Emulsifier-free aqueous dispersion useful in coating comprising aminoplast resin and polymer of monoethylenic carboxylic acid prepared by polymerization in the presence of low molecular weight polyhydric alcohol. 3,983,059, Cl. 260-29.4UA.

Senda, Hisakazu; Yamamoto, Toshiaki; Ueno, Hiroshi; and Nakano, Kazuo, to Dai-Ichi Kogyo Seiyaku Co., Ltd. Separation of wool fatty acid. 3,983,147, Cl. 260-412.800.

Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, to Bayer Aktiengesellschaft. Veterinary feedstuffs. 3,983,235, Cl. 424-250.000.

Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, to Bayer Aktiengesellschaft. Veterinary feedstuffs. 3,983,236, Cl. 424-250.000.

Serafin, John: *See*—
Ford, John L.; and Serafin, John, 3,982,542.

Seragnoli, Enzo, to G. D. Societa per Azioni. Device for sealing thermoplastic overwraps. 3,982,380, Cl. 53-77.000.

Setzer, William C.: *See—*
Winter, Joseph; Setzer, William C.; Graham, Douglas L.; and Pryor, Michael J., 3,983,275.

Shaffer, Donald E., to Thiokol Corporation. Inflation device for a pneumatic orthosis. 3,982,531, Cl. 128-24.00R.

Shakhnes, Jury Alexandrovich: *See—*
Gutman, Mark Borisovich; Kaufman, Vsevolod Grigorievich; Gorodinsky, Mikhail Savelievich; Shakhnes, Jury Alexandrovich; Mezhueva, Larisa Sergeevna; Altukhova, Irina Stepanovna; Kaloshin, Jury Grigorievich, deceased; and Kaloshina, Albina Adolfovna, administratrix, 3,983,013.

Shanley, Robert Loren, II; and Yongue, James McIntire, to RCA Corporation. Apparatus for accentuating amplitude transitions. 3,983,576, Cl. 358-38.000.

Sharif, Louay E.; and Moore, John R., to McDonnell Douglas Corporation. Auxiliary memory unit for use with an electronic display calculator. 3,983,380, Cl. 235-156.000.

Sharma, Jitendra Nath: *See—*
Murthi, Varanasi Aruna; Jain, Padam Chand; Sharma, Jitendra Nath; Srimal, Rikhab Chand; Dhawan, Bhola Nath; and Anand, Nitya, 3,983,121.

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Sharpe, Anthony Nelson, to N.V. Internationale Octrooi Maatschappij "Octropa". Safety valves for protection against liquid contamination. 3,982,538, Cl. 128-276.000.

Shavel, John, Jr.: *See—*
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Shavit, Gideon, to Honeywell Inc. Optimized air conditioning system. 3,982,583, Cl. 165-16.000.

Shaw, Bernard Elliott, to Fullerton, Hodgart & Barclay Limited. Braking apparatus for hoists. 3,982,728, Cl. 254-184.000.

Shea, Philip J.: *See—*
Abdallah, Abdulmuniem H.; and Shea, Philip J., 3,983,250.

Shell Oil Company: *See—*
Skoroszewski, Wladyslaw H., 3,983,202.

Sheng, Ming N.; Zajacek, John G.; and Baker, Thomas N., III, to Atlantic Richfield Company. Epoxidation of olefins with less stable organic hydroperoxides by using an alcohol stabilizing agent. 3,983,143, Cl. 260-348.50L.

Sheratte, Martin B., to McDonnell Douglas Corporation. Functional fluid compositions containing epoxy additives. 3,983,046, Cl. 252-78.500.

Sherrard, William A. Surf-turbine generating system. 3,983,404, Cl. 290-53.000.

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Sherwood Medical Industries Inc.: *See—*
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Shiba, Keisuke; Takei, Haruo; Sato, Akira; and Ogawa, Akira, to Fuji Photo Film Co., Ltd. Silver halide photographic emulsion for use in flash exposure. 3,982,950, Cl. 96-139.000.

Shida, Toshiro: *See—*
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Shimada, Takeo: *See—*
Ohi, Reiichi; Shimada, Takeo; and Oishi, Yasushi, 3,982,944.

Shimada, Yoshiji, to Kinki Printing Company Limited. Method and device for separating carton layers to open a closed type carton container. 3,982,685, Cl. 229-51.0TS.

Shimamura, Takeo: *See—*
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Shimizu, Masanao: *See—*
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Shin-Etsu Chemical Co., Ltd: *See—*
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Shinozaki, Tatsuo; Kikkawa, Nobuyuki; Fujitani, Fumiaki; and Tanaka, Kenjiro, to Idemitsu Kosan Co., Ltd. Method of extracting useful components from microbial cells. 3,983,008, Cl. 195-104.000.

Shionogi & Co., Ltd.: *See—*
Okabe, Kei; Mayama, Mikao; and Matsuura, Shinzo, 3,983,230.

Shipman, George F.: *See—*
Rosynek, Michael P.; Shipman, George F.; and Yan, Tsoung-Yuan, 3,983,030.

Shiroyama, Katsuichi: *See—*
Asaka, Urataro; Hatanaka, Toru; and Shiroyama, Katsuichi, 3,982,507.

Shiurila, John, to Singer Company, The. Precision shaft regulator mechanism. 3,982,442, Cl. 74-10.00R.

Shoemaker, Arthur H., to American Optical Corporation. Microscope objectives. 3,982,821, Cl. 350-175.0ML.

Short, James E., Jr.: *See—*
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Shott, George W., to Lawrence Peska Associates, Inc. Voltage-adjusting electrical plug. 3,983,407, Cl. 307-146.000.

Shulkin, Robert A. Corsage holder. 3,982,303, Cl. 24-6.000.

Sid Richardson Carbon & Gasoline Co.: *See—*
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Sidorov, Pavel Ivanovich: *See—*
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Sieverin, Walter Joseph; and Ruge, Donald Henry, to American Can Company. Flow control apparatus and method. 3,982,619, Cl. 193-31.00R.

Siewert, Johannes: *See—*
Billigmann, Joseph; Schneider, Christoph; Siewert, Johannes; and Sodeik, Manfred, 3,982,968.

Siewert, Robert M.: *See—*
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SIG Schweizerische Industrie-Gesellschaft: *See—*
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Sigl, Wayne C.; and Lassen, Frederick O., to Kimberly-Clark Corporation. Method of solvent drying. 3,982,325, Cl. 34-9.000.

Silbiger, Richard: *See—*
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Sill, Arthur D.: *See—*
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Silverman, Phillip: *See—*
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Silverstein, Herbert. Middle ear aeration and implant. 3,982,545, Cl. 128-350.00R.

Simonovitch, Chaim: *See—*
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Simrad A.S.: *See—*
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Sims, Marion W., to General Electric Company. Wire stator core structure and method of making same. 3,983,433, Cl. 310-254.000.

Sims, Marion W., to General Electric Company. Segmented stator core structure and method for making same. 3,983,434, Cl. 310-254.000.

Sims, Marion W., to General Electric Company. Stator assembly formed of flat, strip material. 3,983,435, Cl. 310-259.000.

Singer Company, The: *See—*
Bury, Fred, 3,982,490.
Shiurila, John, 3,982,442.

Singh, Gyanendra, to Procter & Gamble Company, The. Solid antifoam crystals for dry beverage mixes. 3,983,251, Cl. 426-329.000.

Singh, Kartar: *See—*
Sehgal, Surendra N.; Singh, Kartar; and Vezina, Claude, 3,983,231.

Sinnema, Hendrik. Method for manufacturing molded products. 3,983,207, Cl. 264-297.000.

Sioux Steam Cleaner Corporation: *See—*
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Siranni, J. Donald; and Smith, Charles W., to GTE Sylvania Incorporated. Apparatus and method for determining the proportion of defective wire in a length of moving wire. 3,983,371, Cl. 235-151.300.

Sirek, Thomas, to Wepuko-Hydraulik GmbH, Firma. Piston-sleeve coupling arrangements for a radial piston pump. 3,982,843, Cl. 403-53.000.

Siu, Bernard K.; and Allemang, Richard D., to Rockwell International Corporation. Electrical terminal. 3,982,811, Cl. 339-105.000.

Skinsnes, Olaf K.; and Matsuo, Eiichi. Mycobacteria culture medium and method for in vitro cultivation of leprosy mycobacteria employing same. 3,983,003, Cl. 195-96.000.

Skochdopole, Richard E.: *See—*
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Skoroszewski, Wladyslaw H., to Shell Oil Company. Manufacture of synthetic fibers and yarns. 3,983,202, Cl. 264-147.000.

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Smith, Frank Patterson, II: *See—*
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Tschirky, John E.; and Geczy, Bela A., 3,982,859.

Smith International, Inc.: *See—*
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Smith, Matthew S.; and Filippi, Ernest A. Launch cartridge arrangement. 3,982,467, Cl. 89-1.818.

Smith, Sidney R., to Hughes Aircraft Company. Coax cable seizure device. 3,983,457, Cl. 317-99.000.

SmithKline Corporation: *See—*
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Snam Progetti S.p.A.: *See—*
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Palladino, Nicola; Mazzei, Marcello; and Marconi, Walter, 3,983,308.

Sneckenberger, John E., to Carborundum Company, The. Nozzle noise silencer. 3,982,605, Cl. 181-47.00B.

Snoke, Roy E.: *See—*
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Snyder, Donald L.: *See—*
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Societa' Italiana Resine S.I.R. S.p.A.: *See—*
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Societe Anonyme Automobiles Citroen: *See—*
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S.A. Prb. Societe Anonyme: *See—*
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Societe d'Etude et d'Application des Techniques Nouvelles NEO-TEC: *See—*
Honore, Etienne A. H.; and Torcheux, Emile L. G., 3,983,559.

Societe d'Exploitation des Procedes Marechal S.E.P.M.: *See—*
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Societe d'Exploitation des Procedes Marechal S.E.P.M. (Societe Anonyme): *See—*
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Societe d'Optique, Precision Electronique et Mechanique Sopelem: *See—*
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Sodeik, Manfred: *See—*
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Sohre, Joachim S. Energy conversion device. 3,982,378, Cl. 60-650.000.

Soikie, Anthony Joseph; Jaskulski, Leon; and Hansen, Knud Erik. Hanger for smoke house. 3,982,300, Cl. 17-44.400.

Solar Power Corporation: *See—*
Mahoney, Edmund J.; and Natanson, Paul S., 3,982,963.

Solomon, Arieh, to OR-DA Industries Ltd. Educational board game. 3,982,331, Cl. 35-31.00D.

Solvay & Cie: *See—*
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Sono, Kenzo: *See—*
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Sony Corporation: *See—*
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South African Inventions Development Corporation: *See—*
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Sova, Jacob W. Energy saving cooking utensil. 3,982,479, Cl. 99-447.000.

Spaceair Products, Inc.: *See—*
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Spanoudis, Louis, to Owens-Illinois, Inc. Gas temperature and flow control system. 3,982,584, Cl. 165-42.000.

Specialty Manufacturing Company: *See—*
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Spencer, Blaine G.; Starr, Kenneth E.; and Kunze, Carl Theodore, to Caterpillar Tractor Co. Joint and process for forming same. 3,982,778, Cl. 285-222.000.

Sperry Rand Corporation: *See—*
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Spotz, Donald R. Water jet cleaning appliance. 3,982,965, Cl. 134-100.000.

Sprague Electric Company: *See—*
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Square D Company: *See—*
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Squires, Arthur M. Countercurrent contacting of gas and granular material in panel bed. 3,982,326, Cl. 34-22.000.

Srimal, Rikhab Chand: *See—*
Murthi, Varanasi Aruna; Jain, Padam Chand; Sharma, Jitendra Nath; Srimal, Rikhab Chand; Dhawan, Bhola Nath; and Anand, Nitya, 3,983,121.

Stadigh, Hans-Goran, to Linden-Alimak AB. Electromagnet. 3,983,519, Cl. 335-151.000.

Staebler, Paul J., to Caterpillar Tractor Co. Thrust bearings for slant axis rotary mechanisms. 3,982,860, Cl. 418-53.000.

Stafford, Kenneth R.; and Guadagna, John P., to Fairchild Camera and Instrument Corporation. Charge cancelling structure and method for integrated circuits. 3,983,414, Cl. 307-251.000.

Stalley, Anthony Donald, to Quantel Limited. Cross-talk reduction in semiconductor memory device. 3,983,410, Cl. 307-221.00R.

Stamp, Tom G.; and Dunn, Neil C., to International Harvester Company. Helical element rotor-axial flow combine. 3,982,548, Cl. 130-27.00T.

Standard Folding Cartons, Inc.: *See—*
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Standard Oil Company (Indiana): *See—*
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McCollum, John D.; and Quick, Leonard M., 3,983,028.

Standard Pressed Steel Co.: *See—*
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Standard Register Company, The: *See—*
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Stanish, Ronald J., to AMF Incorporated. Simplified slide switch. 3,983,341, Cl. 200-16.00D.

Stanton, Samuel S.: *See—*
Getchell, Nelson F.; Hollies, Norman R. S.; and Stanton, Samuel S., 3,982,410.

Starr, Kenneth E.: *See—*
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Statz, Hermann; and Feist, Wolfgang M., to Raytheon Company. Semiconductor devices having surface state control. 3,983,574, Cl. 357-31.000.

Stauffer Chemical Company: *See—*
Eilers, Kenneth L.; and Kopacki, Adam F., 3,983,186.
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Steever, Andrew Beaumont; and Jukkola, Walfred Wilhelm, to Dorr-Oliver Incorporated. Heat transfer element and tuyere for fluidized bed reactor. 3,982,901, Cl. 23-284.000.

Steinbach, Ralph L. Tool device. 3,982,846, Cl. 408-226.000.

Steintveit, Georg, to Det Norske Zinkkompani A/S. Process for separation of iron from metal sulphate solutions in hydrometallurgic processes. 3,983,210, Cl. 423-106.000.

Stephens, Ruth E., to Ethyl Corporation. Exhaust catalyst. 3,983,072, Cl. 252-460.000.

Sterling Drug Inc.: *See—*
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Stewart, Charles McGregor: *See—*
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Stewart, Ralph D.: *See—*
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Stjarnovist, Sven Gunnar Harald: *See—*
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Stobb, Anton R., to Stobb, Inc. Signature feeder. 3,982,749, Cl. 271-4.000.

Stobb, Inc.: *See—*
Stobb, Anton R., 3,982,749.

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Stoker, Robert J., to Ingersoll-Rand Company. Water cooling arrangement. 3,983,192, Cl. 261-115.000.

Stolyarchuk, Alexandr Alexandrovich: *See—*
Grinev, Alexei Nikolaevich; Stolyarchuk, Alexandr Alexandrovich; Galenko-Yaroshevsky, Pavel Alexandrovich; Tantsjura, Vladimir Spiridonovich; and Arkhangelskaya, Natalya Vitalievna, 3,983,141.

Stone, Edward; Zamer, Joseph; and Guagliardo, Matthew, to Inmont Corporation. Laminates and method of making them. 3,982,986, Cl. 156-308.000.

Stone, Patrick L.: *See—*
Neal, David A.; and Stone, Patrick L., 3,983,009.

Stone, Richard A.; and Riesgraf, Mathias H. King pin lock for semi-trailers. 3,982,413, Cl. 70-229.000.

Storch, Egon. Penial appliance. 3,982,530, Cl. 128-79.000.

Stork Amsterdam B.V.: *See—*
Kamphuis, Gerrit George, 3,982,480.

Storm, Donald William; and Garland, Carl Curtis. Aerodynamic product unscrambling system and methods of constructing and utilizing same. 3,982,790, Cl. 302-31.000.

Stormann-Menninger-Lerchenthal, Heimo: *See—*
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Stout, Beauford F., to Worthwell Surveys, Inc. Spinner tool for boreholes. 3,982,433, Cl. 73-155.000.

Straihammer, Reinhard, to Siemens Aktiengesellschaft. Operated switch controller for dental engine and associated apparatus. 3,983,344, Cl. 200-86.500.

Straus, Andrew J. D.: *See—*
Berry, James E.; and Straus, Andrew J. D., 3,982,606.

Streckfuss, Heinrich: *See—*
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Strini, Jean-Claude; and Correia, Yves, to Produits Chimiques Pechiney-Saint Gobain. Process for the chlorination of chlorinated ethylene derivatives in the presence of chlorinated ethane derivatives. 3,983,181, Cl. 260-658.00R.

Strobel, Albert F., to GAF Corporation. Branched chain dodecyl isomeric mixtures of 2-(5-dodecyl-2-hydroxy phenyl) benzotriazole as stabilizers for heat and light sensitive materials. 3,983,132, Cl. 260-308.00B.

Strohmeyer, Max: *See—*
Rauch, Konrad; Kiefer, Hans; Hesse, Dieter; Strohmeyer, Max; and Hohenschutz, Heinz, 3,983,010.

Stuart, Richard L., to Rixon Inc. Multi-phase and multi-amplitude level modulator and modulation and demodulation methods. 3,983,485, Cl. 325-30.000.

Stuchly, Stanislaw Szczesny; Rzewuski, Michael Napoleon; and Tarnawecky, Michael Zenon, to Manitoba Research Council. Device for measuring extra high voltage line current. 3,983,477, Cl. 324-117.00R.

Stufflebeam, John F.; and Boetto, Charles, to International Harvester Company. Folding frame structure for agricultural implements. 3,982,773, Cl. 280-656.000.

Suchy, Milos: *See—*
Chodnekar, Madhukar Subraya; Schwieter, Ulrich; Loeliger, Peter; Pfiffner, Albert; Suchy, Milos; and Zurfluh, Rene, 3,983,247.

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Sudduth, Jerome R.; and Keyworth, Donald A., to Tenneco Chemicals, Inc. Process for the removal of vinyl chloride from gas streams. 3,983,216, Cl. 423-240.000.

Suh, Kyung W.; Skochdopole, Richard E.; and Leduc, Malcolm E., to Dow Chemical Company, The. Extrusion foaming of normally crystalline vinylidene chloride polymers. 3,983,080, Cl. 260-2.50B.

Sulzer Brothers Limited: *See—*
Pfarrwaller, Erwin; and Nick, Kurt, 3,982,567.

Sumikawa, Shozo; Maida, Rikichi; and Kageyama, Yuriaki, to International Organics, Inc.; and Kyowa Hakko Kogyo Co., Ltd., part interest to each. Process for the purification of malic acid. 3,983,170, Cl. 260-535.00P.

Sumitomo Chemical Company, Limited: *See—*
Satomi, Takeo; Mukai, Kunio; Mine, Akihiko; Hino, Naganori; Tateishi, Kohshi; and Hirano, Masachika, 3,982,921.

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Sumiyoshi, Masaharu: *See—*
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Sun Oil Company (Delaware): *See—*
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Sun Oil Company of Pennsylvania: *See—*
Felton, George F., Jr., 3,983,044.

Surace, Filippo: *See—*
Garcea, Giampaolo; Surace, Filippo; and Rogora, Edgardo, 3,982,512.

Suzuki, Kenji, to Mitsubishi Denki Kabushiki Kaisha. Phase comparison protective relay for a transmission. 3,983,456, Cl. 317-28.00R.

Suzuki, Masao: *See—*
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Suzuki, Motoo, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Thermal reactor with slidable supports for inner core. 3,982,396, Cl. 60-282.000.

Suzuki, Shizuo: *See—*
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Suzuki, Takuya: *See—*
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Syntex (U.S.A.) Inc.: *See—*
Beeby, Philip J., 3,983,113.

Szabo, Lester J., to Kennecott Copper Corporation. Recovery of metal values from manganese deep sea nodules using ammoniacal cuprous leach solutions. 3,983,017, Cl. 204-106.000.

Szatmari, Istvan: *See—*
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Szewczyk, Edward T. Food preparation and storage device. 3,982,478, Cl. 99-419.000.

Szymczak, Walter. Speed reading aid and method. 3,982,332, Cl. 35-35.00B.

Tabira, Tsutomu: *See—*
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Takahashi, Nobuaki; Itoh, Yasuo; and Kasuga, Masao, to Victor Company of Japan, Limited. Matrix and equalizer circuit with gain control. 3,983,334, Cl. 179-100.4ST.

Takahashi, Nobuaki; Nishikawa, Kazunori; Iwasaki, Yoshiki; Satoh, Masaaki; Ohba, Katsuhiro; Nakamura, Shinji; Sawada, Tatsuo; Ohsaki, Nobuhide; Itoh, Yasuo; Suda, Nobuaki; Okabe, Yasuhisa; and Ozaki, Hideaki, to Victor Company of Japan, Limited. Angle modulated wave demodulation system. 3,983,500, Cl. 329-122.000.

Takahashi, Susumu: *See—*
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Takaishi, Tetsuo: *See—*
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Takao, Hiroshi; Togawa, Kinmochi; and Matoba, Kazuo, to Nissan Motor Co., Ltd. Unitary honeycomb structure and method of making it. 3,982,981, Cl. 156-89.000.

Takei, Haruo: *See—*
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Takeo, Shigeru: *See—*
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Tamburasev, Zrinka: *See—*
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Tamir, Theodor; and Peng, Song-Tsuen, to United States of America, Navy. Directional radiation by asymmetrical dielectric gratings. 3,982,810, Cl. 350-96.00C.

Tamm, Rolf Gunther Arnold, to Bodenseewerk Perkin-Elmer & Co. GmbH. Device for atomization of a sample. 3,982,834, Cl. 356-85.000.

Tammi, Tapio A., to Kajaani Oy, Elektroniika. Method and apparatus for measuring taxi fares. 3,983,378, Cl. 235-151.320.

Tamol, Ronald A.: *See—*
de la Burde, Roger Z.; Aument, Patrick E.; Dawson, Ray F.; and Tamol, Ronald A., 3,982,550.

Tamura, Chihiro: *See—*
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Tan, Yoichi, to Nippon Electric Company, Ltd. Multi-phase PSK demodulator. 3,983,499, Cl. 329-112.000.

Tanaka, Daiichiro: *See—*
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Tanaka, Keihachiro: *See—*
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Tanaka, Kenjiro: *See—*
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Tanaka, Kojiro, to Kabushiki Kaisha Daini Seikosha. Solid state electronic timepiece. 3,982,387, Cl. 58-50.00R.

Tanaka, Shozo: *See—*
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Tanaka, Taro: *See—*
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Tanaka, Yasuzo: *See—*
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Tanaka, Yukiyasu: *See—*
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Tang, Chung-Liang; and Telle, John M., to Research Corporation. Tunable laser systems and method. 3,983,507, Cl. 331-94.50M.
Tanner, Murray Q., III: *See—*
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Tarnawecky, Michael Zenon: *See—*
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Tarzia, Giorgio; and Panzone, Gianbattista, to Gruppo Lepetit S.p.A. Pyrrolo[3,4-b]pyridines. 3,983,127, Cl. 260-295.50B.
Tasi, Laszlo: *See—*
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Tatchell, Keith Reid: *See—*
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Tate, Clarence R., to Thalatta, Inc. Compartmentalized micromagnet display device. 3,982,334, Cl. 35-66.000.
Tateishi, Kohshi: *See—*
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Taunton-Rigby, Alison: *See—*
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Taylor, Charles G. Earth-moving apparatus. 3,982,688, Cl. 299-64.000.
Taylor, John S., to FMC Corporation. Method of preparing a lacquer coated regenerated cellulose film with an intermediate layer of hydroxyalkyl cellulose. 3,983,201, Cl. 264-129.000.
Taylor, Roland S., to General Motors Corporation. Carburetor. 3,983,189, Cl. 261-23.00A.
Tazuma, James J.: *See—*
Gloth, Richard H.; and Tazuma, James J., 3,983,091.
Teach, Eugene G., to Stauffer Chemical Company. Gem-bis amide herbicide antidote compositions and methods of use. 3,982,923, Cl. 71-100.000.
Technical Wire Products, Inc.: *See—*
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Teijin Limited: *See—*
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Teleco Inc.: *See—*
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Telfer, Charles Richard, to Marconi Company Limited, The. Data signal handling arrangements. 3,983,536, Cl. 340-146.1AL.
Telford Smith, Inc.: *See—*
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Telle, John M.: *See—*
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Terahara, Akira: *See—*
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Terasaka, Tetsuichi. Die set. 3,982,458, Cl. 83-685.000.
Teratani, Hiroshi: *See—*
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Terminal Data Corporation: *See—*
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Teumer, Roger G., to Xerox Corporation. Photoelectrophoretic web tension system. 3,982,710, Cl. 242-75.500.
Teutsch, Edward G., to Towmotor Corporation. Lift truck for concrete blocks. 3,982,647, Cl. 214-750.000.
Texaco Inc.: *See—*
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Harrison, Charles W.; Mead, Theodore C.; Moreland, Howard R.; and Barger, Frank L., 3,982,422.
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Tezuka, Toshiyata, to Bridgestone Tire Company Limited. Fluid pressure roller jack. 3,982,731, Cl. 254-93.0HP.
Thacker, Louis H., to United States of America, Energy Research and Development Administration. Compact fast analyzer of rotary cuvette type. 3,982,838, Cl. 356-201.000.
Thalatta, Inc.: *See—*
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Thalen, Bror Arne: *See—*
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Thiokol Corporation: *See—*
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Thom, Derek Walter: *See—*
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Thompson, Norman D.: *See—*
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Thompson, Paige W., to General Electric Company. Thermal actuator, method of controlling such and actuating system. 3,982,398, Cl. 60-531.000.
Thomson-CSF: *See—*
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Scott, Kenneth; and Vause, Arthur Samuel, 3,983,440.
Thorne, David Edward; Baggaley, Keith Howard; and Morgan, Brian, to Beecham Group Limited. Phenyl alkyleneoxy phenyl alkanoic acid esters. 3,983,164, Cl. 260-473.00R.
Thorp, Peter M.: *See—*
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Tiitola, Antti-Jussi, to Karhu-Titan Oy. Stick for hockey or the like. 3,982,760, Cl. 273-67.00A.
Tofe, Andrew John; and Francis, Marion David, to Procter & Gamble Company, The. Dry mixture containing diphosphonates and a stannous salt useful in the preparation of Tc^{99m} containing bone scanning agents. 3,983,227, Cl. 424-1.000.
Togawa, Kinmochi: *See—*
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Torcheux, Emile L. G.: *See—*
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Trane Company, The: *See—*
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Trees, Alonzo. Medical bottle holder. 3,982,716, Cl. 248-206.00A.
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Tresper, Erhard; Freitag, Dieter; and Neuray, Dieter, to Bayer Aktiengesellschaft. Process for the production of $\alpha, \alpha, \alpha, \alpha', \alpha', \alpha'$-hexakisaryl-1,3-and-1,4-dimethyl benzenes. 3,983,146, Cl. 260-395.000.
Tricini, John D., to Kerotest Manufacturing Corporation. Back-up seal for diaphragm valve. 3,982,729, Cl. 251-214.000.
Trifiro, Ferruccio; Villa, Pierluigi; and Cairati, Luciano, to Societa' Italiana Resine S.I.R. S.p.A. Process for preparing a catalyst for the oxidation of methanol to formaldehyde. 3,983,073, Cl. 252-470.000.
Trobisch, Heiner; and Schwinn, Horst, to Behringwerke Aktiengesellschaft. Preparation of a diagnostic agent for measuring the coagulability of blood. 3,983,004, Cl. 195-99.000.
Troger, Jurgen; Weiberg, Otto; and Weigert, Wolfgang, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of 1,1'-peroxydicyclohexylamine. 3,983,131, Cl. 260-307.0FB.
Tropeano, Thomas F. Safety guard attachment for bicycles and other two-wheel vehicles. 3,982,771, Cl. 280-289.00R.
Troue, Harden Henry, to Union Carbide Corporation. Method and apparatus for operating a mercury vapor lamp. 3,983,385, Cl. 240-47.000.
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B 285,796	3,914,303	Oct. 21, 1975	B 318,745	3,916,571	Nov. 4, 1975
B 286,499	3,914,129	Oct. 21, 1975	B 319,226	3,925,082	Dec. 9, 1975
B 286,614	3,924,696	Dec. 9, 1975	B 319,339	3,916,056	Oct. 28, 1975
B 286,913	3,928,696	Dec. 23, 1975	B 319,402	3,919,568	Nov. 11, 1975
B 287,164	3,914,139	Oct. 21, 1975	B 319,414	3,928,666	Dec. 23, 1975
B 287,270	3,924,825	Dec. 9, 1975	B 320,261	3,924,033	Dec. 2, 1975
B 287,275	3,925,141	Dec. 9, 1975	B 320,452	3,925,083	Dec. 9, 1975
B 287,373	3,918,568	Nov. 11, 1975	B 320,603	3,915,571	Oct. 28, 1975

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JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 321,018	3,921,623	Nov. 25, 1975	B 346,210	3,916,142	Oct. 28, 1975
B 321,101	3,917,163	Nov. 4, 1975	B 346,350	3,915,824	Oct. 28, 1975
B 321,938	3,923,889	Dec. 2, 1975	B 346,487	3,927,406	Dec. 16, 1975
B 322,182	3,925,390	Dec. 9, 1975	B 346,585	3,913,820	Oct. 21, 1975
B 322,239	3,920,973	Nov. 18, 1975	B 346,613	3,923,545	Dec. 2, 1975
B 322,564	3,914,373	Oct. 21, 1975	B 346,901	3,915,583	Oct. 28, 1975
B 322,611	3,920,863	Nov. 18, 1975	B 348,083	3,923,774	Dec. 2, 1975
B 322,777	3,924,382	Dec. 9, 1975	B 348,383	3,923,452	Dec. 2, 1975
B 323,127	3,923,967	Dec. 2, 1975	B 348,495	3,914,654	Oct. 21, 1975
B 323,191	3,914,566	Oct. 21, 1975	B 348,558	3,914,109	Oct. 21, 1975
B 323,203	3,916,165	Oct. 28, 1975	B 349,141	3,915,363	Oct. 28, 1975
B 323,568	3,920,536	Nov. 18, 1975	B 349,177	3,914,033	Oct. 21, 1975
B 323,666	3,924,568	Dec. 9, 1975	B 349,231	3,915,831	Oct. 28, 1975
B 324,495	3,928,664	Dec. 23, 1975	B 349,321	3,916,103	Oct. 28, 1975
B 324,503	3,928,524	Dec. 23, 1975	B 349,948	3,914,557	Oct. 21, 1975
B 324,505	3,925,294	Dec. 9, 1975	B 350,025	3,927,415	Dec. 16, 1975
B 324,739	3,924,990	Dec. 9, 1975	B 350,143	3,924,419	Dec. 9, 1975
B 324,879	3,923,538	Dec. 2, 1975	B 350,219	3,917,802	Nov. 4, 1975
B 325,102	3,924,355	Dec. 9, 1975	B 350,245	3,914,331	Oct. 21, 1975
B 325,262	3,921,304	Nov. 25, 1975	B 350,523	3,924,726	Dec. 9, 1975
B 326,514	3,925,080	Dec. 9, 1975	B 350,589	3,927,419	Dec. 16, 1975
B 327,109	3,925,350	Dec. 9, 1975	B 350,708	3,923,871	Dec. 2, 1975
B 327,363	3,923,504	Dec. 2, 1975	B 350,843	3,915,461	Oct. 28, 1975
B 327,612	3,925,620	Dec. 9, 1975	B 351,055	3,914,074	Oct. 21, 1975
B 327,674	3,918,540	Nov. 11, 1975	B 351,218	3,914,186	Oct. 21, 1975
B 327,899	3,925,674	Dec. 9, 1975	B 351,222	3,921,179	Nov. 18, 1975
B 328,164	3,914,703	Oct. 21, 1975	B 351,348	3,923,563	Dec. 2, 1975
B 328,200	3,916,031	Oct. 28, 1975	B 351,421	3,914,733	Oct. 21, 1975
B 328,205	3,914,106	Oct. 21, 1975	B 351,493	3,914,758	Oct. 21, 1975
B 328,210	3,914,275	Oct. 21, 1975	B 351,535	3,915,239	Oct. 28, 1975
B 328,870	3,916,486	Nov. 4, 1975	B 351,665	3,919,701	Nov. 11, 1975
B 329,115	3,924,727	Dec. 9, 1975	B 351,672	3,914,000	Oct. 21, 1975
B 329,476	3,920,562	Nov. 18, 1975	B 351,735	3,913,385	Oct. 21, 1975
B 329,612	3,925,128	Dec. 9, 1975	B 351,863	3,914,700	Oct. 21, 1975
B 329,787	3,920,688	Nov. 18, 1975	B 351,883	3,924,657	Dec. 9, 1975
B 329,816	3,923,947	Dec. 2, 1975	B 351,926	3,914,133	Oct. 21, 1975
B 330,536	3,925,452	Dec. 9, 1975	B 351,939	3,913,480	Oct. 21, 1975
B 330,828	3,913,589	Oct. 21, 1975	B 352,445	3,928,746	Dec. 23, 1975
B 331,417	3,914,157	Oct. 21, 1975	B 352,934	3,913,692	Oct. 21, 1975
B 331,557	3,916,577	Nov. 4, 1975	B 352,950	3,922,590	Nov. 25, 1975
B 331,895	3,916,403	Oct. 28, 1975	B 352,965	3,921,926	Nov. 25, 1975
B 332,527	3,924,017	Dec. 2, 1975	B 353,317	3,916,446	Nov. 4, 1975
B 332,811	3,924,359	Dec. 9, 1975	B 353,387	3,924,404	Dec. 9, 1975
B 333,876	3,921,208	Nov. 18, 1975	B 353,546	3,913,273	Oct. 21, 1975
B 333,928	3,927,172	Dec. 16, 1975	B 354,008	3,925,081	Dec. 9, 1975
B 334,251	3,924,719	Dec. 9, 1975	B 354,098	3,925,547	Dec. 9, 1975
B 334,868	3,919,469	Nov. 11, 1975	B 354,145	3,927,279	Dec. 16, 1975
B 334,985	3,923,912	Dec. 2, 1975	B 354,296	3,914,580	Oct. 21, 1975
B 335,670	3,928,686	Dec. 23, 1975	B 354,510	3,928,658	Dec. 23, 1975
B 335,741	3,925,615	Dec. 9, 1975	B 354,889	3,913,204	Oct. 21, 1975
B 335,773	3,920,953	Nov. 18, 1975	B 354,979	3,914,251	Oct. 21, 1975
B 336,129	3,923,606	Dec. 2, 1975	B 355,095	3,925,656	Dec. 9, 1975
B 336,243	3,925,422	Dec. 9, 1975	B 355,269	3,914,561	Oct. 21, 1975
B 336,345	3,925,179	Dec. 9, 1975	B 355,510	3,913,704	Oct. 21, 1975
B 336,652	3,914,211	Oct. 21, 1975	B 355,595	3,925,649	Dec. 9, 1975
B 336,902	3,918,897	Nov. 11, 1975	B 355,876	3,925,685	Dec. 9, 1975
B 336,946	3,919,425	Nov. 11, 1975	B 356,032	3,928,636	Dec. 23, 1975
B 336,978	3,923,968	Dec. 2, 1975	B 356,253	3,925,025	Dec. 9, 1975
B 337,235	3,919,386	Nov. 11, 1975	B 356,602	3,927,393	Dec. 16, 1975
B 337,409	3,925,258	Dec. 9, 1975	B 356,724	3,924,586	Dec. 9, 1975
B 337,442	3,913,658	Oct. 21, 1975	B 357,039	3,924,406	Dec. 9, 1975
B 337,703	3,914,690	Oct. 21, 1975	B 357,057	3,913,738	Oct. 21, 1975
B 337,787	3,923,506	Dec. 2, 1975	B 357,131	3,924,453	Dec. 9, 1975
B 339,057	3,924,822	Dec. 9, 1975	B 357,402	3,914,180	Oct. 21, 1975
B 339,218	3,925,121	Dec. 9, 1975	B 357,682	3,924,973	Dec. 9, 1975
B 339,699	3,933,527	Jan. 20, 1976	B 357,803	3,919,470	Nov. 11, 1975
B 339,838	3,930,221	Dec. 30, 1975	B 358,174	3,924,958	Dec. 9, 1975
B 340,212	3,922,645	Nov. 25, 1975	B 358,244	3,913,411	Oct. 21, 1975
B 340,833	3,925,208	Dec. 9, 1975	B 358,311	3,923,561	Dec. 2, 1975
B 341,579	3,913,363	Oct. 21, 1975	B 358,939	3,924,713	Dec. 9, 1975
B 342,084	3,928,694	Dec. 23, 1975	B 359,174	3,914,117	Oct. 21, 1975
B 342,423	3,925,334	Dec. 9, 1975	B 359,187	3,924,525	Dec. 9, 1975
B 342,886	3,923,507	Dec. 2, 1975	B 359,540	3,915,235	Oct. 28, 1975
B 343,136	3,919,453	Nov. 11, 1975	B 359,740	3,936,212	Feb. 3, 1976
B 343,240	3,925,693	Dec. 9, 1975	B 359,791	3,929,430	Dec. 30, 1975
B 343,506	3,916,021	Oct. 28, 1975	B 359,825	3,921,344	Nov. 25, 1975
B 343,577	3,921,165	Nov. 18, 1975	B 359,946	3,914,132	Oct. 21, 1975
B 344,203	3,928,719	Dec. 23, 1975	B 359,947	3,914,653	Oct. 21, 1975
B 344,479	3,924,042	Dec. 2, 1975	B 360,208	3,923,750	Dec. 2, 1975
B 345,060	3,916,018	Oct. 28, 1975	B 360,296	3,916,720	Nov. 4, 1975
B 345,384	3,916,146	Oct. 28, 1975	B 360,719	3,915,715	Oct. 28, 1975
B 345,390	3,940,343	Feb. 24, 1976	B 360,910	3,925,696	Dec. 9, 1975
B 345,422	3,914,392	Oct. 21, 1975	B 361,265	3,923,569	Dec. 2, 1975
B 345,527	3,927,365	Dec. 16, 1975	B 361,443	3,927,405	Dec. 16, 1975
B 345,567	3,913,985	Oct. 21, 1975	B 361,569	3,914,554	Oct. 21, 1975
B 346,165	3,913,293	Oct. 21, 1975	B 361,604	3,922,702	Nov. 25, 1975

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JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 361,734	3,915,764	Oct. 28, 1975	B 386,403	3,924,895	Dec. 9, 1975
B 362,589	3,914,012	Oct. 21, 1975	B 386,592	3,925,305	Dec. 9, 1975
B 363,205	3,923,744	Dec. 2, 1975	B 387,039	3,924,510	Dec. 9, 1975
B 363,337	3,928,639	Dec. 23, 1975	B 387,331	3,913,701	Oct. 21, 1975
B 363,457	3,922,595	Nov. 25, 1975	B 387,363	3,927,378	Dec. 16, 1975
B 363,674	3,929,716	Dec. 30, 1975	B 387,687	3,918,151	Nov. 11, 1975
B 363,892	3,913,395	Oct. 21, 1975	B 387,761	3,914,245	Oct. 21, 1975
B 363,962	3,921,826	Nov. 25, 1975	B 387,790	3,925,380	Dec. 9, 1975
B 364,022	3,913,499	Oct. 21, 1975	B 387,818	3,918,935	Nov. 11, 1975
B 364,163	3,916,092	Oct. 28, 1975	B 388,580	3,923,712	Dec. 2, 1975
B 364,241	3,916,668	Nov. 4, 1975	B 389,070	3,914,171	Oct. 21, 1975
B 364,334	3,924,670	Dec. 9, 1975	B 389,285	3,914,631	Oct. 21, 1975
B 364,528	3,919,510	Nov. 11, 1975	B 389,327	3,924,504	Dec. 9, 1975
B 364,786	3,921,673	Nov. 25, 1975	B 389,639	3,914,626	Oct. 21, 1975
B 364,910	3,925,335	Dec. 9, 1975	B 389,726	3,921,010	Nov. 18, 1975
B 365,490	3,918,527	Nov. 11, 1975	B 389,807	3,922,623	Nov. 25, 1975
B 365,834	3,914,702	Oct. 21, 1975	B 389,932	3,913,268	Oct. 21, 1975
B 365,841	3,925,628	Dec. 9, 1975	B 389,933	3,913,267	Oct. 21, 1975
B 365,855	3,917,258	Nov. 4, 1975	B 390,679	3,913,668	Oct. 21, 1975
B 366,287	3,924,946	Dec. 9, 1975	B 390,732	3,913,878	Oct. 21, 1975
B 366,402	3,928,053	Dec. 23, 1975	B 391,184	3,914,214	Oct. 21, 1975
B 366,589	3,914,719	Oct. 21, 1975	B 391,210	3,914,220	Oct. 21, 1975
B 367,021	3,914,752	Oct. 21, 1975	B 391,437	3,915,416	Oct. 28, 1975
B 367,040	3,924,775	Dec. 9, 1975	B 391,509	3,925,175	Dec. 9, 1975
B 367,661	3,914,158	Oct. 21, 1975	B 391,675	3,916,017	Oct. 28, 1975
B 367,739	3,923,648	Dec. 2, 1975	B 392,154	3,923,809	Dec. 2, 1975
B 367,812	3,924,789	Dec. 9, 1975	B 392,242	3,926,636	Dec. 16, 1975
B 368,081	3,924,691	Dec. 9, 1975	B 392,696	3,916,175	Oct. 28, 1975
B 368,387	3,924,923	Dec. 9, 1975	B 392,732	3,914,903	Oct. 21, 1975
B 368,392	3,913,812	Oct. 21, 1975	B 392,753	3,916,341	Oct. 28, 1975
B 368,397	3,914,677	Oct. 21, 1975	B 392,894	3,914,763	Oct. 21, 1975
B 368,862	3,925,549	Dec. 9, 1975	B 393,163	3,914,535	Oct. 21, 1975
B 369,563	3,924,449	Dec. 9, 1975	B 393,970	3,914,638	Oct. 21, 1975
B 369,607	3,923,786	Dec. 2, 1975	B 394,088	3,914,740	Oct. 21, 1975
B 369,997	3,913,533	Oct. 21, 1975	B 394,188	3,924,591	Dec. 9, 1975
B 370,453	3,964,101	Jun. 15, 1976	B 394,300	3,914,159	Oct. 21, 1975
B 370,706	3,925,242	Dec. 9, 1975	B 394,712	3,916,306	Oct. 28, 1975
B 371,073	3,930,135	Dec. 30, 1975	B 395,478	3,922,577	Nov. 25, 1975
B 371,085	3,923,783	Dec. 2, 1975	B 395,496	3,919,435	Nov. 11, 1975
B 371,787	3,921,217	Nov. 18, 1975	B 395,671	3,920,418	Nov. 18, 1975
B 371,805	3,914,433	Oct. 21, 1975	B 395,889	3,913,190	Oct. 21, 1975
B 371,836	3,923,541	Dec. 2, 1975	B 396,025	3,913,869	Oct. 21, 1975
B 372,823	3,924,660	Dec. 9, 1975	B 396,551	3,921,929	Nov. 25, 1975
B 373,297	3,924,436	Dec. 9, 1975	B 397,027	3,923,736	Dec. 2, 1975
B 373,326	3,920,433	Nov. 18, 1975	B 397,527	3,913,488	Oct. 21, 1975
B 373,428	3,915,511	Oct. 28, 1975	B 397,990	3,914,848	Oct. 28, 1975
B 375,220	3,920,417	Nov. 18, 1975	B 398,262	3,913,481	Oct. 21, 1975
B 375,652	3,921,303	Nov. 25, 1975	B 398,551	3,924,924	Dec. 9, 1975
B 376,504	3,914,570	Oct. 21, 1975	B 398,597	3,913,743	Oct. 21, 1975
B 376,654	3,922,513	Nov. 25, 1975	B 398,625	3,920,996	Nov. 18, 1975
B 376,742	3,924,392	Dec. 9, 1975	B 399,292	3,914,810	Oct. 28, 1975
B 376,799	3,913,955	Oct. 21, 1975	B 399,304	3,919,567	Nov. 11, 1975
B 377,172	3,918,255	Nov. 11, 1975	B 399,349	3,925,694	Dec. 9, 1975
B 377,683	3,924,433	Dec. 9, 1975	B 399,766	3,915,667	Oct. 28, 1975
B 377,833	3,913,884	Oct. 21, 1975	B 400,080	3,925,163	Dec. 9, 1975
B 377,869	3,917,002	Nov. 4, 1975	B 400,293	3,923,719	Dec. 2, 1975
B 378,621	3,923,840	Dec. 2, 1975	B 400,310	3,915,507	Oct. 28, 1975
B 379,038	3,923,994	Dec. 2, 1975	B 401,133	3,924,443	Dec. 9, 1975
B 379,172	3,914,379	Oct. 21, 1975	B 401,992	3,924,898	Dec. 9, 1975
B 379,282	3,913,462	Oct. 21, 1975	B 402,065	3,925,413	Dec. 9, 1975
B 379,955	3,913,157	Oct. 21, 1975	B 402,555	3,914,688	Oct. 21, 1975
B 380,014	3,921,915	Nov. 25, 1975	B 403,140	3,913,486	Oct. 21, 1975
B 380,141	3,925,161	Dec. 9, 1975	B 403,355	3,913,352	Oct. 21, 1975
B 380,310	3,921,048	Nov. 18, 1975	B 403,990	3,914,684	Oct. 21, 1975
B 380,312	3,913,953	Oct. 21, 1975	B 403,996	3,916,016	Oct. 28, 1975
B 380,338	3,924,873	Dec. 9, 1975	B 404,290	3,924,918	Dec. 9, 1975
B 380,446	3,923,836	Dec. 2, 1975	B 404,437	3,915,200	Oct. 28, 1975
B 380,900	3,913,307	Oct. 21, 1975	B 405,136	3,915,565	Oct. 28, 1975
B 380,926	3,925,095	Dec. 9, 1975	B 405,137	3,915,566	Oct. 28, 1975
B 381,074	3,919,583	Nov. 11, 1975	B 405,160	3,924,821	Dec. 9, 1975
B 381,632	3,914,732	Oct. 21, 1975	B 405,248	3,926,294	Dec. 16, 1975
B 381,847	3,921,152	Nov. 18, 1975	B 405,305	3,922,111	Nov. 25, 1975
B 382,018	3,929,742	Dec. 30, 1975	B 405,360	3,913,403	Oct. 21, 1975
B 382,021	3,913,212	Oct. 21, 1975	B 405,495	3,924,577	Dec. 9, 1975
B 382,261	3,914,991	Oct. 28, 1975	B 405,938	3,920,109	Nov. 18, 1975
B 382,290	3,924,717	Dec. 9, 1975	B 406,065	3,914,199	Oct. 21, 1975
B 382,783	3,919,527	Nov. 11, 1975	B 406,357	3,924,529	Dec. 9, 1975
B 382,798	3,924,435	Dec. 9, 1975	B 406,800	3,952,708	Apr. 27, 1976
B 382,840	3,922,007	Nov. 25, 1975	B 407,736	3,924,463	Dec. 9, 1975
B 383,465	3,927,412	Dec. 16, 1975	B 407,357	3,924,614	Dec. 9, 1975
B 383,532	3,914,246	Oct. 21, 1975	B 407,728	3,925,240	Dec. 9, 1975
B 383,581	3,925,318	Dec. 9, 1975	B 408,487	3,924,046	Dec. 2, 1975
B 384,499	3,925,135	Dec. 9, 1975	B 408,749	3,914,116	Oct. 21, 1975
B 384,658	3,913,452	Oct. 21, 1975	B 409,026	3,925,497	Dec. 9, 1975
B 384,773	3,915,416	Oct. 28, 1975	B 409,220	3,915,648	Oct. 28, 1975
B 385,210	3,913,406	Oct. 21, 1975	B 409,251	3,922,620	Nov. 25, 1975

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JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 409,657	3,927,362	Dec. 16, 1975
B 409,816	3,921,317	Nov. 25, 1975
B 410,062	3,923,855	Dec. 2, 1975
B 410,168	3,914,717	Oct. 21, 1975
B 411,145	3,914,168	Oct. 21, 1975
B 411,356	3,919,649	Nov. 11, 1975
B 411,483	3,925,196	Dec. 9, 1975
B 411,633	3,914,741	Oct. 21, 1975
B 412,516	3,927,417	Dec. 16, 1975
B 412,619	3,925,292	Dec. 9, 1975
B 412,867	3,924,587	Dec. 9, 1975
B 413,006	3,914,850	Oct. 28, 1975
B 413,546	3,924,314	Dec. 9, 1975
B 414,129	3,925,484	Dec. 9, 1975
B 414,288	3,925,537	Dec. 9, 1975
B 415,113	3,915,717	Oct. 28, 1975
B 415,124	3,915,944	Oct. 28, 1975
B 415,845	3,925,076	Dec. 9, 1975
B 415,847	3,914,208	Oct. 21, 1975
B 415,957	3,925,635	Dec. 9, 1975
B 415,977	3,927,359	Dec. 16, 1975
B 416,598	3,923,473	Dec. 2, 1975
B 416,832	3,924,975	Dec. 9, 1975
B 416,710	3,923,746	Dec. 2, 1975
B 416,933	3,924,968	Dec. 9, 1975
B 417,299	3,918,235	Nov. 11, 1975
B 418,121	3,925,023	Dec. 9, 1975
B 418,153	3,925,251	Dec. 9, 1975
B 418,302	3,913,252	Oct. 21, 1975
B 419,327	3,921,197	Nov. 18, 1975
B 419,481	3,924,970	Dec. 9, 1975
B 420,016	3,914,572	Oct. 21, 1975
B 420,148	3,927,414	Dec. 16, 1975
B 420,514	3,923,929	Dec. 2, 1975
B 420,568	3,925,069	Dec. 9, 1975
B 421,026	3,914,785	Oct. 21, 1975
B 421,362	3,924,817	Dec. 9, 1975
B 421,383	3,925,047	Dec. 9, 1975
B 421,797	3,914,023	Oct. 21, 1975
B 422,399	3,928,656	Dec. 23, 1975
B 422,467	3,924,804	Dec. 9, 1975
B 422,949	3,921,873	Nov. 25, 1975
B 424,415	3,919,458	Nov. 11, 1975
B 424,462	3,920,522	Nov. 18, 1975
B 424,572	3,924,979	Dec. 9, 1975
B 424,748	3,924,395	Dec. 9, 1975
B 425,035	3,914,025	Oct. 21, 1975
B 425,345	3,922,015	Nov. 25, 1975
B 425,470	3,923,796	Dec. 2, 1975
B 425,539	3,916,742	Nov. 4, 1975
B 425,541	3,914,051	Oct. 21, 1975
B 425,572	3,923,822	Dec. 2, 1975
B 427,631	3,921,433	Nov. 25, 1975
B 428,177	3,914,624	Oct. 21, 1975
B 428,795	3,921,056	Nov. 18, 1975
B 429,442	3,923,485	Dec. 2, 1975
B 430,106	3,918,941	Nov. 11, 1975
B 430,140	3,922,084	Nov. 25, 1975
B 430,798	3,918,204	Nov. 11, 1975
B 430,944	3,922,096	Nov. 25, 1975
B 432,373	3,919,670	Nov. 11, 1975
B 433,587	3,914,567	Oct. 21, 1975
B 435,343	3,919,244	Nov. 11, 1975
B 435,844	3,925,170	Dec. 9, 1975
B 437,173	3,924,627	Dec. 9, 1975
B 437,172	3,913,251	Oct. 21, 1975
B 437,195	3,914,618	Oct. 21, 1975
B 437,450	3,922,479	Nov. 25, 1975
B 438,053	3,916,013	Oct. 28, 1975
B 438,706	3,925,050	Dec. 9, 1975
B 439,168	3,919,676	Nov. 11, 1975
B 439,669	3,921,499	Nov. 25, 1975
B 440,898	3,921,789	Nov. 25, 1975
B 441,024	3,913,629	Oct. 21, 1975
B 441,416	3,913,851	Oct. 21, 1975
B 442,280	3,914,054	Oct. 21, 1975
B 442,859	3,918,570	Nov. 11, 1975
B 442,919	3,925,483	Dec. 9, 1975
B 444,614	3,927,996	Dec. 23, 1975
B 445,471	3,914,711	Oct. 21, 1975
B 445,740	3,923,612	Dec. 2, 1975
B 448,571	3,924,760	Dec. 9, 1975
B 449,647	3,916,797	Nov. 4, 1975
B 450,499	3,920,526	Nov. 18, 1975
B 450,546	3,924,417	Dec. 9, 1975
B 450,927	3,913,844	Oct. 21, 1975
B 455,520	3,922,543	Nov. 25, 1975
B 455,775	3,914,356	Oct. 21, 1975
B 456,346	3,914,531	Oct. 21, 1975
B 459,425	3,928,773	Dec. 23, 1975
B 461,872	3,919,586	Nov. 11, 1975
B 467,684	3,915,119	Oct. 28, 1975
B 468,198	3,925,340	Dec. 9, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 78,315	3,982,192	Feb. 10, 1976	Sep. 21, 1976	B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976	B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976	B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976
B 160,045	3,983,446	Jan. 13, 1976	Sep. 28, 1976	B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976	B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976
B 248,240	3,983,556	Jan. 13, 1976	Sep. 28, 1976	B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976	B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976
B 308,659	3,981,947	Jan. 27, 1976	Sep. 21, 1976	B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976	B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976	B 519,979	3,982,067	Feb. 3, 1976	Sep. 21, 1976
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976	B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976
B 378,513	3,984,750	Jan. 27, 1976	Sep. 21, 1976	B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976
B 379,177	3,981,976	Jan. 27, 1976	Sep. 21, 1976	B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976
B 385,631	3,982,924	Jan. 27, 1976	Sep. 28, 1976	B 521,046	3,983,434	Feb. 24, 1976	Sep. 28, 1976
B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976	B 521,324	3,983,143	Jan. 27, 1976	Sep. 28, 1976
B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976	B 521,480	3,982,665	Jan. 13, 1976	Sep. 28, 1976
B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976	B 521,600	3,981,458	Jan. 27, 1976	Sep. 21, 1976
B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976	B 521,984	3,983,220	Feb. 17, 1976	Sep. 28, 1976
B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976	B 521,986	3,981,607	Feb. 3, 1976	Sep. 21, 1976
B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976	B 522,577	3,982,123	Jan. 27, 1976	Sep. 21, 1976
B 409,848	3,983,270	Jan. 27, 1976	Sep. 28, 1976	B 523,885	3,981,040	Feb. 17, 1976	Sep. 21, 1976
B 411,471	3,982,933	Feb. 17, 1976	Sep. 28, 1976	B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976
B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976	B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976
B 414,481	3,982,979	Jan. 20, 1976	Sep. 28, 1976	B 527,054	3,981,559	Feb. 17, 1976	Sep. 21, 1976
B 417,014	3,981,851	Jan. 13, 1976	Sep. 21, 1976	B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976
B 427,883	3,982,277	Jan. 20, 1976	Sep. 21, 1976	B 527,999	3,981,682	Feb. 3, 1976	Sep. 21, 1976
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976	B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976	B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976	B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976	B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976	B 534,016	3,983,381	Feb. 3, 1976	Sep. 28, 1976
B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976	B 534,313	3,981,675	Jan. 27, 1976	Sep. 21, 1976
B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976	B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976
B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976	B 534,333	3,981,480	Feb. 17, 1976	Sep. 21, 1976
B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976	B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976
B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976	B 534,991	3,983,517	Jan. 27, 1976	Sep. 28, 1976
B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976	B 535,076	3,981,718	Jan. 20, 1976	Sep. 21, 1976
B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976	B 535,386	3,981,150	Jan. 13, 1976	Sep. 21, 1976
B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976	B 535,391	3,981,386	Jan. 27, 1976	Sep. 21, 1976
B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976	B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976
B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976	B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976
B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976	B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976
B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976	B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976
B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976	B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976
B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976	B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976
B 467,412	3,981,265	Jan. 13, 1976	Sep. 21, 1976	B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976
B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976	B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976
B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976	B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976
B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976	B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976
B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976	B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976
B 472,284	3,982,078	Jan. 13, 1976	Sep. 21, 1976	B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976
B 475,681	3,983,332	Jan. 20, 1976	Sep. 28, 1976	B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976
B 476,577	3,982,070	Jan. 20, 1976	Sep. 21, 1976	B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976
B 479,242	3,983,074	Feb. 17, 1976	Sep. 28, 1976	B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976
B 481,600	3,981,235	Jan. 27, 1976	Sep. 21, 1976	B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976
B 481,737	3,982,057	Jan. 13, 1976	Sep. 21, 1976	B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976
B 483,256	3,981,723	Feb. 10, 1976	Sep. 21, 1976	B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976
B 484,029	3,983,558	Feb. 10, 1976	Sep. 28, 1976	B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976
B 484,365	3,983,578	Jan. 27, 1976	Sep. 28, 1976	B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976
B 485,060	3,983,067	Feb. 17, 1976	Sep. 28, 1976	B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976
B 486,280	3,983,130	Feb. 3, 1976	Sep. 28, 1976	B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976
B 487,411	3,983,579	Feb. 24, 1976	Sep. 28, 1976	B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976
B 488,395	3,982,245	Jan. 27, 1976	Sep. 21, 1976	B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976
B 488,634	3,982,158	Jan. 20, 1976	Sep. 21, 1976	B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976
B 491,032	3,981,892	Feb. 10, 1976	Sep. 21, 1976	B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976
B 492,301	3,981,073	Jan. 13, 1976	Sep. 21, 1976	B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976
B 492,688	3,983,415	Jan. 20, 1976	Sep. 28, 1976	B 551,527	3,982,599	Jan. 13, 1976	Sep. 28, 1976
B 496,487	3,982,261	Jan. 20, 1976	Sep. 21, 1976	B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976
B 498,500	3,982,241	Jan. 20, 1976	Sep. 21, 1976	B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976
B 499,227	3,981,344	Jan. 27, 1976	Sep. 21, 1976	B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976
B 499,352	3,981,391	Jan. 27, 1976	Sep. 21, 1976	B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976
B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976	B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976
B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976	B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976
B 501,993	3,981,606	Jan. 13, 1976	Sep. 21, 1976	B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976
B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976	B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976
B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976	B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976
B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976	B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976	B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976	B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976
B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976	B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976
B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976	B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 1976
B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976	B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976
B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976	B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976
B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976	B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976
B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976	B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976
B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976	B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976	B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 28TH DAY OF SEPTEMBER, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Association pour la Recherche et le Developpement des Methodes et Processus Industriels A.R.M.I.N.E.S.: *See*—
Sindzingre, Michel Jacques; Villamayor, Michel; and Robert, Alain, Re. 28,983.

Boyles, Robert L.; and Polonsky, Samuel, to General Electric Company. Alarm clock timer with manually operable reset mechanism. Re. 28,985, Cl. 200-38.0FA.

Brooks, Warren B., to Mobil Oil Corporation. Fail-safe subsea fluid transportation system. Re. 28,978, Cl. 166-.500.

Crawford, Robert W.; and Witsiepe, William K., to Du Pont de Nemours, E. I., and Company. Blends of thermoplastic copolyester elastomers with vinyl chloride polymers. Re. 28,982, Cl. 260-873.000.

Drinkuth, William H.; and Stephens, Edward J., to Emhart Industries, Inc. Article inspection by successively televised images. Re. 28,984, Cl. 178-6.000.

Du Pont de Nemours, E. I., and Company: *See*—
Crawford, Robert W.; and Witsiepe, William K., Re. 28,982.

Emhart Industries, Inc.: *See*—
Drinkuth, William H.; and Stephens, Edward J., Re. 28,984.

General Electric Company: *See*—
Boyles, Robert L.; and Polonsky, Samuel, Re. 28,985.

Grad-Line, Inc.: *See*—
Long, George E.; Johnson, Floyd C.; and Reese, Dennis L., Re. 28,979.

Heinrich, Theodore M.; and Kernick, Andress, to Westinghouse Electric Corporation. Static inverter wherein a pluraliy of square waves are so summed as to produce a sinusoidal output wave. Re. 28,986, Cl. 321-5.000.

Hyde, Jack, to Koppers Company, Inc. Refractory shapes and jamb structure of coke oven battery heating wall. Re. 28,981, Cl. 202-223.000.

Johnson, Floyd C.: *See*—
Long, George E.; Johnson, Floyd C.; and Reese, Dennis L., Re. 28,979.

Kernick, Andress: *See*—
Heinrich, Theodore M.; and Kernick, Andress, Re. 28,986.

Koppers Company, Inc.: *See*—
Hyde, Jack, Re. 28,981.

Long, George E.; Johnson, Floyd C.; and Reese, Dennis L., to Grad-Line, Inc. Control system for road grader. Re. 28,979, Cl. 172-4.500.

Mackenzie, Harold B. Discrete material transporting and dumping apparatus and method. Re. 28,980, Cl. 214-38.00D.

Mason, Edward E., to Shotcrete Engineering, Ltd Method for the construction of a retaining wall. Re. 28,977, Cl. 61-39.000.

Mobil Oil Corporation: *See*—
Brooks, Warren B., Re. 28,978.

Polonsky, Samuel: *See*—
Boyles, Robert L.; and Polonsky, Samuel, Re. 28,985.

Reese, Dennis L.: *See*—
Long, George E.; Johnson, Floyd C.; and Reese, Dennis L., Re. 28,979.

Robert, Alain: *See*—
Sindzingre, Michel Jacques; Villamayor, Michel; and Robert, Alain, Re. 28,983.

Shotcrete Engineering, Ltd.: *See*—
Mason, Edward E., Re. 28,977.

Sindzingre, Michel Jacques; Villamayor, Michel; and Robert, Alain, to Association pour la Recherche et le Developpement des Methodes et Processus Industriels A.R.M.I.N.E.S. Resistance and modulus reinforcing materials. Re. 28,983, Cl. 428-114.000.

Stephens, Edward J.: *See*—
Drinkuth, William H.; and Stephens, Edward J., Re. 28,984.

Villamayor, Michel: *See*—
Sindzingre, Michel Jacques; Villamayor, Michel; and Robert, Alain, Re. 28,983.

Westinghouse Electric Corporation: *See*—
Heinrich, Theodore M.; and Kernick, Andress, Re. 28,986.

Witsiepe, William K.: *See*—
Crawford, Robert W.; and Witsiepe, William K., Re. 28,982.

Zinn, Daniel L. Method of making walls. Re. 28,976, Cl. 52-747.000.

LIST OF DESIGN PATENTEES

AB Bygg- och Transportekonomi (BT) : *See*—
Mono, Rune G. 241,633.

AMP Inc.: *See*—
Pauza, William V., and Sheesley. 241,650.

Abrams, Hyman. Combined napkin holder and condiment caddy. 241,598, 9–28–76, Cl. D7—72.

Acushnet Co. : *See*—
Lynch, Francis D., Jepson, and Brown. 241,676.

Addmaster Corp. : *See*—
Hauser, Steven G. 241,651.

Alladin Enterprises Ltd. : *See*—
Krush, Emil, and Boulanger. 241,637.

Althans, Richard K., and M. H. Boldt, to Zenith Radio Corp. Television receiver. 241,679, 9–28–76, Cl. D56—4.

Amerock Corp. : *See*—
Tegner, Raymond U. H. 241,605.
Tegner, Raymond U. H. 241,606.
Tegner, Raymond U. H. 241,607.
Tegner, Raymond U. H. 241,609.

Andersen, Herbert H., Jr., and S. A. Machcinski III. Handle for electrical connectors. 241,649, 9–28–76, Cl. D26—1.

Application des Gaz : *See*—
Huguet, Alain, and Vache. 241,658.

Arpin, John B., and S. L. Feldman. Shower head. 241,642, 9–28–76, Cl. D23—35.

Ashton, Harold P., to Dart Industries Inc. Combined food storage containers and carrying handle. 241,600, 9–28–76, Cl. D7—76.

Bailey, James R. Linear clock. 241,627, 9–28–76, Cl. D10—15.

Bailey, James R. Linear clock. 241,628, 9–28–76, Cl. D10—15.

Baron Rubber Ltd. : *See*—
Sebestik, Ladislav. 241,586.

Baskin-Robbins Ice Cream Co. : *See*—
Richman, Leon H., and Clayton. 241,594.

Bausch & Lomb Inc. : *See*—
Huckenbeck, Claus O. 241,680.

Baxter Travenol Laboratories, Inc. : *See*—
Shine, Dennis F., Wilson, and Witty. 241,660.

Beard, Lawrence R. : *See*—
Singer, John D., Beard, and Conner. 241,668.

Behnke, Edward R. : *See*—
Schreyer, Kenneth D., and Behnke. 241,616.

Bell & Howell Co. : *See*—
Pacholok, Jaroslaw. 241,677.
Wells, Thomas R. 241,681.

Bell Telephone Laboratories, Inc. : *See*—
Genaro, Donald M., Kelly, McGarvey, and Tyler. 241,655.
Genaro, Donald M., Kelly, McGarvey, and Tyler. 241,656.

Berkline Corp., The : *See*—
Long, Stapleton. 241,588.

Boldt, Melvin H. : *See*—
Althans, Richard K., and Boldt. 241,679.

Bonsack Baths Ltd. : *See*—
Bonsack, Horst G. 241,643.

Bonsack, Horst G., to Bonsack Baths Ltd. Bathtub. 241,643, 9–28–76, Cl. D23—55.

Boulanger, Roger : *See*—
Krush, Emil, and Boulanger. 241,637.

Brown, Daniel H., and J. R. Fish scaler. 241,641. 9–28–76, Cl. D22—31.

Browning Arms Co. : *See*—
Wood Marc G. 241,636.

Brown, Joseph R. : *See*—
Brown, Daniel H., and J. R. 241,641.

Brown, Robert A. : *See*—
Lynch, Francis D., Jepson, and Brown. 241,676.

Burke, Roger A., and P. J. Clemmer, to Hughes Aircraft Co. Digital wristwatch. 241,630. 9–28–76, Cl. D10—32.

Burns, Donald A. Cordless tape winder. 241,654. 9–28–76, Cl. D26—14.

Capehart Corp. : *See*—
Kaye, Leonard. 241,678.

Cartier, Inc. : *See*—
Durante, Alfred J. 241,669.

Cible, Pierre, to Cible Projecteurs. Sealed beam headlight. 241,673, 9–28–76, Cl. D48—32.

Cible Projecteurs : *See*—
Cible, Pierre. 241,673.

Clayton, James M. : *See*—
Richman, Leon H., and Clayton. 241,594.

Clemmer, Paul J. : *See*—
Burke, Roger A., and Clemmer. 241,630.

Colgate-Palmolive Co. : *See*—
Koenigsberg, Victor. 241,620.

Columbus McKinnon Corp. : *See*—
Schreyer, Kenneth D., and Behnke. 241,616.

Conner, James M. : *See*—
Singer, John D., Beard, and Conner. 241,668.

Cook, William J., to General Electric Co. Combined skillet and chafing dish or the like. 241,601, 9–28–76, Cl. D7—90.

Confer, Douglas C.: *See*—
Confer, Raymond C., and D. C. 241,597.
Confer Plastics Inc.: *See*—
Confer, Raymond C., and D. C. 241,597.
Confer, Raymond C., and D. C., to Confer Plastics Inc. Funnel. 241,597, 9–28–76, Cl. D7—68.
Crescenzi, Donald C., and F. J. Fontana, to Steward-Warner Corp. Dual wheel caster. 241,611, 9–28–76, Cl. D8—226.

Crossbow, Inc.: *See*—
Trott, David H. 241,624.
Croyle, Jack V., and J. B. Swett, to Dart Industries Inc. Freezer storage container. 241,599. 9–28–76, Cl. D7—76.
Dart Industries Inc.: *See*—
Ashton, Harold P. 241,600.
Croyle, Jack V., and Swett. 241,599.
Layton, Harry. 241,589.
Dawson, Thomas J., to Genie Toys, Inc. Toy stuffed dog. 241,661, 9–28–76, Cl. D34—2.
D'Ercoli, Giacinto C., and J. P. Kelly, to McGraw-Edison Co. Floodlight. 241,671, 9–28–76, Cl. D48—20.
Deere & Co.: *See*—
Singer, John D., Beard, and Conner. 241,668.
Dill, Wiley H. Religious display. 241,569, 9–28–76, Cl. D11—157.
Docutel Corp.: *See*—
McCauley, Edward H., and O'Kelly. 241,652.
Durante, Alfred J., to Cartier, Inc. Diamond pendant. 241,669, 9–28–76, Cl. D11—81.
Durco, Andrew, Jr. Digital clock. 241,626, 9–28–76, Cl. D10—15.
Ewers, Ronald L., and R. W. Zick, to The Toro Co. Combined playground climber and slide. 241,664, 9–28–76, Cl. D34—5.
Famolare, Inc.: *See*—
Famolare, Joseph P., Jr. 241,585.
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19R	3,982,523
59.5	3,982,524
99R	3,982,525
270	3,982,526
	3,982,527
CLASS 127	
46A	3,982,956
CLASS 128	
2.05T	3,982,528
24R	3,982,531
79	3,982,530
146	3,982,532
184	3,982,533
214C	3,982,534
214E	3,982,535
260	3,982,536
	3,982,537
276	3,982,538
	3,982,539
278	3,982,540
303.1	3,982,541
303.14	3,982,542
335.5	3,982,543
349R	3,982,544
350R	3,982,545
	3,982,546
452	3,982,547
CLASS 130	
27T	3,982,548
	3,982,549
CLASS 131	
140P	3,982,550
CLASS 132	
73	3,982,551
CLASS 134	
57D	3,982,552
100	3,982,965
CLASS 136	
89	3,982,963
	3,982,964
CLASS 137	
81	3,982,553
82	3,982,554
103	3,982,555
432	3,982,556
441	3,982,557
455	3,982,558
	3,982,559
527.8	3,982,560
596.2	3,982,561
625.4	3,982,562
798	3,982,563
CLASS 138	
110	3,982,564
176	3,982,565
CLASS 139	
35	3,982,566
439	3,982,567
452	3,982,568
CLASS 141	
5	3,982,569
95	3,982,570
225	3,982,571
CLASS 144	
193D	3,982,572
CLASS 148	
1.5	3,982,967
6.15R	3,982,968
12F	3,982,969
20.3	3,982,970
31.55	3,982,972
31.57	3,982,971
32	3,982,973
175	3,982,974
CLASS 149	
19.9	3,982,975
CLASS 150	
.5	3,982,573
9	3,982,574
CLASS 151	
22	3,982,575
CLASS 152	
155	3,982,576
204	3,982,577
358	3,982,578
361R	3,982,579
	3,982,580
CLASS 156	
7	3,982,976
72	3,982,977
	3,982,978
73.5	3,982,980
73.6	3,982,979
89	3,982,981
143	3,982,982
154	3,982,983
244	3,982,984
303.1	3,982,985
308	3,982,986
361	3,982,987
380	3,982,988
403	3,982,989
443	3,982,990
515	3,982,991
583	3,982,992
CLASS 160	
340	3,982,581
CLASS 162	
158	3,982,993
CLASS 164	
136	3,982,582
CLASS 165	
16	3,982,583
42	3,982,584
83	3,982,585
107	3,982,586

149 3,982,587
165 3,982,588

CLASS 166

.5 Re.28,978
53 3,982,589
173 3,982,590
302 3,982,591
3,982,592

CLASS 172

4.5 Re.28,979
40 3,982,593

CLASS 174

19 3,983,310
50 3,983,311
84R 3,983,312
121SR 3,983,313
138F 3,983,314

CLASS 175

373 3,982,595
410 3,982,596

CLASS 176

78 3,982,994

CLASS 178

6 Re.28,984
3,983,315
6.6DD 3,983,318
6.6P 3,983,316
6.6R 3,983,317
6.7R 3,983,319
6.8 3,983,320
3,983,328
7.6 3,983,321
19 3,983,322
58R 3,983,323
59 3,983,324
69.5R 3,983,325

CLASS 179

1CN 3,983,332
1E 3,983,333
1.5R 3,983,326
3,983,327
15AT 3,983,330
15BF 3,983,329
18GE 3,983,331
100.4ST 3,983,334
100.41K 3,983,335
107FD 3,983,336
115.5R 3,983,337
175.2C 3,983,338
3,983,339
175.3S 3,983,340

CLASS 180

5R 3,982,597
9.54 3,982,598
53R 3,982,599
69C 3,982,600
89R 3,982,601
114 3,982,602
131 3,982,603
158 3,982,604

CLASS 181

47B 3,982,605
102 3,982,606
152 3,982,607

CLASS 182

49 3,982,608

CLASS 184

56A 3,982,609

CLASS 188

18A 3,982,610
71.1 3,982,611
73.1 3,982,612

CLASS 190

58B 3,982,613

CLASS 192

30W 3,982,614
103F 3,982,615
104C 3,982,616
106.2 3,982,617
113B 3,982,618

CLASS 193

31R 3,982,619

CLASS 194

1G 3,982,621
1N 3,982,620

CLASS 195

3H 3,982,995
29 3,982,996
31F 3,982,997
49 3,982,998
63 3,982,999
3,983,000
66R 3,983,001
3,983,002
96 3,983,003
99 3,983,004
103 5R 3,983,005
3,983,006
103.7 3,983,007
104 3,983,008

CLASS 197

1R 3,982,622

CLASS 198

362 3,982,623
486 3,982,624
572 3,982,625
626 3,982,626

CLASS 200

11J 3,983,352
16D 3,983,341
26 3,983,342
38FA Re.28,985
47 3,983,343
61.47 3,983,350
83R 3,983,351
86.5 3,983,344
144B 3,983,345
148R 3,983,346
3,983,353
155R 3,983,354
157 3,983,347
264 3,983,355
314 3,983,348
339 3,983,349

CLASS 202

93 3,983,009
223 Re.28,981

CLASS 203

15 3,983,010
59 3,983,011

CLASS 204

15 3,983,012
39 3,983,013
58 3,983,014
59F 3,983,015
89 3,983,016
106 3,983,017
130 3,983,018
157.1R 3,983,019
3,983,020
164 3,983,021
192 3,983,022
3,983,023
198 3,983,024
225 3,983,025
258 3,983,026

CLASS 206

45.14 3,982,628
106 3,982,629
369 3,982,630
380 3,982,631

CLASS 208

8 3,983,027
9 3,983,028
59 3,983,029
253 3,983,030

CLASS 209

75 3,982,632

CLASS 210

15 3,983,031
22R 3,983,032
49 3,983,033
73W 3,983,034
138 3,983,035
356 3,983,036
416R 3,983,037
447 3,983,038

CLASS 211

4 3,982,633

CLASS 212

1 3,982,634

CLASS 214

1BB 3,982,635
1A 3,982,636
1Q 3,982,627
6D 3,982,637
10.5R 3,982,638
16.4C 3,982,639
17CB 3,982,640
38D Re.28,980
58 3,982,641
131A 3,982,643
301 3,982,642
394 3,982,644
620 3,982,645
670 3,982,646
750 3,982,647
776 3,982,648

CLASS 217

108 3,982,649

CLASS 219

10.55A 3,983,356
85A 3,983,357
124 3,983,358
284 3,983,359
301 3,983,360
433 3,983,361
521 3,983,362
3,983,363

CLASS 220

4B 3,982,651
4F 3,982,650
7 3,982,652
9LG 3,982,653
21 3,982,654
23.6 3,982,655
238 3,982,656
268 3,982,657
337 3,982,658

CLASS 221

63 3,982,659
190 3,982,660
235 3,982,661
296 3,982,662

CLASS 222

1 3,982,663
21 3,982,664
67 3,982,665
70 3,982,666
3,982,667
95 3,982,668
146HE 3,982,669
177 3,982,670
178 3,982,671
274 3,982,672
306 3,982,673
402.21 3,982,674

CLASS 224

26R 3,982,675
45R 3,982,676

CLASS 226

75 3,982,677

CLASS 227

63 3,982,678
116 3,982,679

CLASS 228

174 3,982,680

CLASS 229

4.5 3,982,681
14C 3,982,682
17R 3,982,683
28R 3,982,684
51BP 3,982,686
51TS 3,982,685
62 3,982,687
71 3,982,689

CLASS 232

17 3,982,690

CLASS 233

2 3,982,691

CLASS 235

61.11A 3,983,365
61.11R 3,983,366
61.6E 3,983,364
92SB 3,983,367
150.21 3,983,372
150.53 3,983,369
151.1 3,983,370
151.13 3,983,376
151.3 3,983,368
3,983,371
3,983,373
3,983,374
3,983,375
151.31 3,983,377
151.32 3,983,378
152 3,983,379
154 3,983,381
156 3,983,380
173 3,983,382
176 3,983,383

CLASS 238

349 3,982,692

CLASS 239

88 3,982,693
96 3,982,694
136 3,982,695
265.17 3,982,696
289 3,982,697
394 3,982,698

CLASS 240

37 3,983,384
47 3,983,385
81R 3,983,386
147 3,983,387

CLASS 241

14 3,982,699
46.11 3,982,700
58 3,982,702
100.5 3,982,703
298 3,982,704

CLASS 242

4B 3,982,705
18PW 3,982,707
18.1 3,982,706
36 3,982,708
55.19A 3,982,701
74 3,982,709
75.5 3,982,710
86.52 3,982,711
129 3,982,712

CLASS 244

3.1 3,982,713
3.16 3,982,714

CLASS 248

2 3,982,715
206A 3,982,716
313 3,982,717
421 3,982,718
489 3,982,719

CLASS 249

81 3,982,720
139 3,982,721

CLASS 250

223R 3,983,388
227 3,983,389
231R 3,983,390
237G 3,983,391
272 3,983,392
326 3,983,393
363S 3,983,394
370 3,983,395
402 3,983,396
406 3,983,397
445T 3,983,398
3,983,399
468 3,983,400
492A 3,983,401
3,983,402
492R 3,983,039
560 3,983,403

CLASS 251

4 3,982,722
5 3,982,723
7 3,982,724
14 3,982,725
133 3,982,726
152 3,982,727
214 3,982,729

CLASS 252

8.1 3,983,040
8.8 3,983,043
17 3,983,041
18 3,983,042
33.6 3,983,044
62.1P 3,983,045
78.5 3,983,046
119 3,983,047
178 3,983,048
299 3,983,049
301.1W 3,983,050
301.4R 3,983,051
412 3,983,052
430 3,983,053
439 3,983,054
454 3,983,055
460 3,983,072
470 3,983,073
500 3,983,074
511 3,983,075
518 3,983,076
520 3,983,077
540 3,983,078
545 3,983,079

CLASS 254

10.5 3,982,730
93HP 3,982,731
139.1 3,982,732
173R 3,982,733
184 3,982,728

CLASS 256

13.1 3,982,734
59 3,982,735

CLASS 259

107 3,982,736

CLASS 260

2.3 3,983,087
2.5AJ 3,983,081
2.5B 3,983,080
2.5S 3,983,082
17.2 3,983,084
23XA 3,983,085
3,983,086
24 3,983,088
29.2EP 3,983,056
29.2TN 3,983,058
29.4UA 3,983,059
29.6MN 3,983,061
29.6RW 3,983,060
29.6TA 3,983,057
29.7H 3,983,062
30.2 3,983,063
3,983,064
30.4N 3,983,065
3,983,066
30.4R 3,983,067
33.2R 3,983,068
33.8UB 3,983,069
38 3,983,070
42 3,983,071
42.18 3,983,090
45.95H 3,983,091
47CP 3,983,093
47EN 3,983,092
77.5AM 3,983,094
112.5R 3,983,099
143 3,983,100
144 3,983,101
239.1 3,983,105
239.3B 3,983,106
239.5 3,983,111
239.55R 3,983,112
240J 3,983,107
240K 3,983,089
240R 3,983,113
243C 3,983,108
3,983,109
247.2B 3,983,110
248AS 3,983,114
249.5 3,983,115
3,983,116
249.8 3,983,117
251.5 3,983,118
256.4F 3,983,119
3,983,120
268BQ 3,983,121
289AZ 3,983,122
293.55 3,983,123
293.62 3,983,124
294.8C 3,983,125
295R 3,983,126
295.5B 3,983,127
296H 3,983,128
302E 3,983,129
307FB 3,983,131
307D 3,983,130
308B 3,983,132
309.6 3,983,133
309.7 3,983,134
3,983,135
326.12R 3,983,137
326.43 3,983,138
326.8 3,983,136
330.5 3,983,139
343.5 3,983,140
346.2R 3,983,141
348C 3,983,142
348.5L 3,983,143
373 3,983,145
395 3,983,146
397.3 3,983,144
412.8 3,983,147
435A 3,983,149
448R 3,983,150
448.2E 3,983,148
465F 3,983,151
3,983,160
465.9 3,983,161
468D 3,983,152
3,983,153
3,983,154
3,983,155
471A 3,983,162
471R 3,983,156
473A 3,983,157
3,983,158
3,983,163
3,983,165
473R 3,983,159
3,983,164
481R 3,983,166
486R 3,983,167
501.16 3,983,168
501.17 3,983,169
535P 3,983,170
535R 3,983,171
544C 3,983,172
559AT 3,983,173
562B 3,983,174
586R 3,983,175
591 3,983,176
593R 3,983,177
621R 3,983,178
653.3 3,983,179
657 3,983,180
658R 3,983,181
665R 3,983,182
680B 3,983,183
837R 3,983,184
863 3,983,185
873 Re.28,982
876R 3,983,186
880R 3,983,187
940 3,983,188
963 3,983,098

CLASS 261

23A 3,983,189
111 3,983,190
114R 3,983,191
115 3,983,192

CLASS 264

36 3,983,193
41 3,983,194
45.3 3,983,195
45.5 3,983,196
56 3,983,197
65 3,983,198
89 3,983,199
117 3,983,200
129 3,983,201
147 3,983,202
150 3,983,203
244 3,983,204
254 3,983,205
255 3,983,206
297 3,983,207

CLASS 267

102 3,982,737
121 3,982,738

CLASS 269

37 3,982,739
110 3,982,740
325 3,982,741
328 3,982,742

CLASS 270

1 3,982,743
12 3,982,744
31 3,982,745
37 3,982,746

CLASS 271

4 3,982,749
151 3,982,750
221 3,982,751
248 3,982,752
275 3,982,753

CLASS 272

113 3,982,754
117 3,982,755
126 3,982,756
134 3,982,757

CLASS 273

29R 3,982,758
31 3,982,759
67A 3,982,760
102.4 3,982,761
106.5B 3,982,762
135A 3,982,764
135D 3,982,763

CLASS 277

53 3,982,765

CLASS 280

1 3,982,766
11.37H 3,982,747
18 3,982,748
43.12 3,982,767
79.1 3,982,768
284 3,982,770
289R 3,982,771
462 3,982,772
656 3,982,773
737 3,982,774
744 3,982,769
3,982,775

CLASS 285

24 3,982,776
192 3,982,777
222 3,982,778
328 3,982,779

CLASS 290

53 3,983,404

CLASS 293

1 3,982,780

CLASS 294

19A 3,982,781
64R 3,982,782

CLASS 296

137E 3,982,783

CLASS 297

1 3,982,784
160 3,982,785
284 3,982,786
317 3,982,787

CLASS 299

64 3,982,688

CLASS 301

44T 3,982,788

CLASS 302

14 3,982,789
31 3,982,790

CLASS 303

3 3,982,791
6A 3,982,792
21P 3,982,793
24A 3,982,794
52 3,982,795

CLASS 307

10R 3,983,405
88.3 3,983,406
146 3,983,407
221D 3,983,408
3,983,409
221R 3,983,410
225C 3,983,411
235F 3,983,412
3,983,413
251 3,983,414
255 3,983,415
260 3,983,416
261 3,983,417
270 3,983,418

277 3,983,419
279 3,983,420
311 3,983,421
322 3,983,422

CLASS 308

122 3,982,796
139 3,982,797

CLASS 310

4R 3,983,423
8.1 3,983,424
8.7 3,983,425
46 3,983,426
61 3,983,427
71 3,983,428
91 3,983,429
155 3,983,430
233 3,983,431
242 3,983,432
254 3,983,433
3,983,434
259 3,983,435

CLASS 312

138A 3,982,798
270 3,982,799
305 3,982,800
306 3,982,801
348 3,982,802

CLASS 313

35 3,983,436
99 3,983,437
113 3,983,513
146 3,983,438
174 3,983,439
217 3,983,440
222 3,983,441
251 3,983,442
341 3,983,443
413 3,983,444
452 3,983,446
485 3,983,445

CLASS 315

64 3,983,447
151 3,983,448
244 3,983,449
370 3,983,450
387 3,983,451
397 3,983,452
399 3,983,453

CLASS 317

14J 3,983,454
27R 3,983,455
28R 3,983,456
99 3,983,457
101CP 3,983,458
101DH 3,983,459
114 3,983,460
151 3,983,461

CLASS 318

139 3,983,462
227 3,983,463
327 3,983,464
338 3,983,466
376 3,983,465
593 3,983,467
685 3,983,468

CLASS 321

5 Re.28,986
9R 3,983,469
60 3,983,470

CLASS 322

28 3,983,471

CLASS 323

17 3,983,472
22R 3,983,473
78 3,982,814

CLASS 324

43R 3,983,474
3,983,475
111 3,983,476
117R 3,983,477
154R 3,983,478
158R 3,983,479
169 3,983,480
186 3,983,481

CLASS 325

6 3,983,482
16 3,983,483
20 3,983,484
30 3,983,485
308 3,983,486
315 3,983,487
346 3,983,488
449 3,983,489
452 3,983,490
455 3,983,491
468 3,983,492

CLASS 328

14 3,983,493
21 3,983,494
34 3,983,495
110 3,983,496
155 3,983,497
3,983,498

CLASS 329

112 3,983,499
122 3,983,500
3,983,501

CLASS 330

14 3,983,502
18 3,983,503
107 3,983,504
3,983,505

CLASS 331

17 3,983,506
94.5PE 3,983,508
94.5H 3,983,509
3,983,510
94.5M 3,983,507
94.5P 3,983,511
108B 3,983,512

CLASS 333

30R 3,983,514
3,983,515
70R 3,983,518
71 3,983,516
72 3,983,517

CLASS 335

151 3,983,519
170 3,983,520
216 3,983,521

CLASS 336

70 3,983,522
84 3,983,523

CLASS 337

159 3,983,524
186 3,983,525
278 3,983,526

CLASS 338

35 3,983,527
195 3,983,528

CLASS 339

37 3,982,803
41 3,982,804
59R 3,982,805
64R 3,982,806
75MP 3,982,807
88R 3,982,808
91R 3,982,809
105 3,982,811
111 3,982,812
127R 3,982,813

CLASS 340

5C 3,983,530
5H 3,983,529
31R 3,983,531
41R 3,983,532
52R 3,983,533
63 3,983,534
146.1AL 3,983,536
146.3SY 3,983,535
172.5 3,983,537
3,983,538
3,983,539
3,983,540
3,983,541
173FF 3,983,543
3,983,545
173R 3,983,542
3,983,544
173.1 3,983,546
174TF 3,983,547
206 3,983,549
221 3,983,550
228R 3,983,548
276 3,983,551
280 3,983,552
365R 3,983,553
413 3,983,554

CLASS 343

5R 3,983,555
7A 3,983,556
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37 : 3,982,697
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39 : Re.28,986
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6	241,594		241,601		241,671		241,661		241,678		241,684
	241,608		241,611		241,677	34	241,642	37	241,641	47	241,588
	241,610		241,629		241,679	36	241,589	39	241,591		241,621
	241,612		241,632		241,681		241,597		241,624	48	241,614
	241,613		241,683	18	241,644		241,598		241,646		241,626
	241,630	12	241,599		241,665		241,603	40	241,604		241,638
	241,640		241,619	24	241,590		241,616		241,623		241,652
	241,651	13	241,659	25	241,631		241,620	42	241,593	49	241,636
	241,653	17	241,625		241,634		241,645		241,595	53	241,666
	241,660		241,627		241,676		241,654		241,596	54	241,639
	241,662		241,628	26	241,664		241,655		241,602	55	241,605
	241,663		241,635		241,670		241,656		241,647		241,606
	241,675		241,648	27	241,674		241,668		241,650		241,607
	241,680		241,649	29	241,622		241,669	44	241,600		241,609
9	241,592		241,667								

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U.S. DEPARTMENT OF COMMERCE
Elliot L. Richardson, Secretary

PATENT AND TRADEMARK OFFICE
C. Marshall Dann, Commissioner